CLINICAL EVALUATION OF SIDDHA DRUG SAARA PARPAM IN THE TREATMENT OF AZHAL KALLADAIPPU (RENAL CALCULI)

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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled "CLINICAL EVALUATION OF SIDDHA DRUG "**SAARA PARPAM"** IN THE TREATMENT OF **AZHAL KALLADAIPPU (RENAL CALCULI)"** Guidance of **Dr.T.Lakshmi kanthamM.D(s)** Department of Maruthuvam, National Institute of Siddha, Chennai -47, and the dissertation work has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

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CONTENTS

INTRODUCTION

Siddha system of medicine is one of the oldest systems of medicine in South India especially in Tamilnadu. It is a traditional system of medicine which is gradually evolved. Eighteen Siddhars had contributed much to the development of this medical system.

According to the ancient Siddha texts human body is made up of five elements(Panja Bootham-earth,water,fire,air and space) and controlled by three humors called Vatham,Pitham,andKapham.

In normal healthy individual these three vital humours exists in the ratio of 1:1/2:1/4 respectively, when the three humours disturbed disease will occur.

Vatham is formed by air and space elements. It controls the nervous system. Pitham is formed by fire element. It controls the metabolic functions of the body. Kapham is formed by water and earth elements and concerns with all types of secretions inthe body.

The three humours are considered as the three pillar of health and support the structure and functions of the body

According to Siddha system various psychological and physiological function of body depends on seven physical constituents(Udalthathukkal): Saram (food juice), Cheneer (Blood), Oon (muscle) Kozhuppu (Fatty tissue), elumbu (bone), Majai (bone marrow), Sukkilam or suronitham (semen or ovum).

Siddhar's classified the disease into 4448. The disease Kalladaippu is one among them.It is caused due to the derangement of Pitham humour.

According to Tamil Vaithyasathagam, the seats of pitham humour are as follows:pingalai ,urinary bladder, Stomach, umbilicus, epigastric region, sweat, saliva, essence of food, eyes, and skin.

தூனான பித்தம் பிங்கலையைப்பற்றி
சாய்வான பிராணவாயுவதனைச்சேர்ந்து
ஊனான நீர்பையில ணுகிமூலத்
துதித்தெழுந்தவக்கினியை யுறவுசெய்து
மானே கேளிருதயத்தி லிருப்புமாகி
கோனான சிரந்தனிலே யிறக்கமாகிக்
கொண்டு நின்ற பித்தநிலை கூறினோமே

- தமிழ் வைத்தியசதகம்.

As per Yugi Vaithya Chintamani Kalladippu is classified into 4 types.Azhal Kalladaippu one among them.The signs and symptoms of azhalkalladaippu Yugivathiyachinthamani text, oliguria, urethral pain which mimics the pain caused by the insertion of iron rod in the urethra, sweating all over the body,anuria,agonizing pain, blood stained calculus stagnated in urethra can be correlated with renal calculus in modern science.

In India approximately 5-7 million persons are suffering from stone disease in India and at least 1/1000 of Indian population needs hospitalization due to kidney stone disease. India the ‘stone belt” occupies parts of Maharastra, Gujarat, Punjab, Haryana, Delhi and Rajasthan. In these regions the disease is so prevalent, that most of the members of a family will suffer from kidney stones sometimes in their lives.

Kidney stones are most commonly found in people between the ages of 20-40.

Urinary stones can be classified according to the following aspects of stone size shape, and location composition.

In the text PatharthagunaVilakkamThaathujeevavaguppu, SAARA PARPAM (Internal drug) a Siddha formulation has been indicated for Kalladaippu. The method of preparation seems to be simple and cost effective. The main drugNavacharam, Vediuppu are well known for theirdiuretic actions as per Siddha literature.

The above said drug formulation has undergone safety studies[Ref.1.Dr.P.Arunmozhi,RegNo- 3210102 hepatoproductive activity of SAARA PARPAM in Ccl_4 induced RatsIOSR journal of Pharmacy and Biological science volume 5,Issue (6 March – april 2013) 2.Dissertation done in 2013] and clinical documentation was not done yet.So I have selected the siddha formulation “SAARA PARPAM” (Internal) for further clinical evaluation in Azhal Kaladaippu.

Dietary risk factors for stone disease were shown different by age and sex. In particular inyounger women dietarycalcium, phytate, fluid intake was associated with a reduced risk of stone formation, whereas animal protein and sucrose increased the risk of stone incidence. In older adults there was no association betweendietary calcium and stone formation. Whereas magnesium, potassiumand fluid intake decreased and total Vit C intake increased the risk of symptomatic nephrolithiasis. Animal protein was associated with risk only in men with a body mass index 25 kg / m^2.

Type 2 diabetes and several other coronary heart disease risk factors including hypertension and obesity are associated with nephrolithiasis.

AIM

Clinical evaluation of siddha drug **"Saara parpam"** (internal) in the treatment of**"Azhal kalladaippu noi"** (Renal calculi)

OBJECTIVES:

1. **Primary objective:**

   To study the siddha formulation Saara parpam in the treatment of Azhal Kalladaippu (Renal Calculi) for the Clearance/reduction in the size of renal calculus.

2. **Secondary objective**:

   To study azhal kalladaippu, on the basis of Envagai thervu, mukkutram, kalam, naadi, neerkuri, neikuri, etc,, in order to evaluvate the pathology.

   To study the siddha cofactors related to the diseases such as age, sex, food habits, occupation etc.

A. SIDDHA ASPECT

AZHAL KALLADAIPPU

Siddhars classified the diseases into 4448 and described each one separately and elaborately. They classified the disease on the basis of Vatham, Pitham, and Kabham humors.

The disease kalladaippu is placed under NeerinaiArukkalnoi (Oligurial diseases). This has been mentioned by Therayar in his: **"Therankarisal"** as follows,

நீரிருவினைகுணத்தைநீயறிவித்துசொல்வாம்
நீரினைபெருக்கலொன்றுநீரினையருக்கலொன்று
நீரிழிவுடனேகொல்லும் நீர்க்கட்டுவினைகளொன்று

-தேரன் கரிசல்

As per **Yugi Vaithiya Chinthaamanai**, Kalladaippu is classified into 4 types. AzhalKalladaippu is one among the four types of Kalladaippu.

தோன்றின தோர் நாலினிடநாமங் கேளாய்
சுறுக்கான வாதத்தின் கல்லடைப்பு
பூன்றியதோர் பித்தத்தின் கல்லடைப்பு
புரண்டதோர் சேத்துமத்தின் கல்லடைப்பு

- யூகிவைத்தியசிந்தாமணி

Kalladippu

Definition:

As per the Siddha text **"Siddha Maruthuvam"** (Author: Dr. Kuppusamy), there is gradual or sudden obstruction to the flow of urine, pain with burning sensation in the urethral tract, low back pain , renal angle pain and sand like crystal deposit in the urine are the characteristic features of kalladaippu.

Pothu kurikunangal:

According to the text Siddha maruthuvam (pothu)

- Gradual or sudden obstruction to flow of urine.
- Unbearable pain (agonizing pain) in the peins.
- Excruciating pain and swelling is experienced at the tip of penis if the calculus attempts to expel.
- Burning and scanty micturition and haematuria.

- Colicky pain radiating from loin to groin, lower abdomen, urethra, and genitalia if the calculus is irregular with sharp projection

Etiology:

Accoring to **Yugi Vaithiya Chinthamani,**

கலங்கினதோர் தண்ணீர் தான் குடித்தபேர்க்கும்
கல்லெலும்பு மயிர்மண்தான் கலந்தன் னத்தில்
அலங்கினதோ ரன்னங்கள ருந்தலாலும்
அழுகலோடு முற்றபண்ட மருந்தலாலும்
மலங்கினதோர் மாப்பண்ட மருந்தலாலும்
மந்தத்தில் வாய்வான பதார்த்தந் தன்னை
துலங்கினதோ ருசிதன்னிற் சுவைத்தலாலும்
சுருக்ககாய் கல்லடைப்பு வந்து தோன்றுந் தானே

- **யூகிவைத்தியசிந்தாமணி.**

As per **Yugi Vaithiya Chinthamani**, Kalladaippu is due to

- Intake of turbid water
- Food contaminated with stones, bones, hair and sand
- Intake of purtrified food stuff and starch substances
- Eating flatulence producing food while indigestion

தெளிந்ததோர் கல்லலடைப்புற் பத்திகேளாய்
சிறிதுநாட் டுடங்கியேமேகந் தன்னால்
தளிந்ததோர் சலப்பையிலுதிரந் தோய்ந்து
சந்தசந்தாகவேபருத்துக் கொள்ளும்
வளிந்ததோர் வாதபித்தங் கோபித் தக்கால்
வந்துபொருங்கல்லாய் நீர்வழியடைத்து
நளிந்ததோர் நாலுவிதக் கல்லடைப்பு
நண்பானவரலாறுநாட்டக் கேளே

- **யூகிவைத்தியசிந்தாமணி**

Yugimamunivar has revealed about this disease since 14thcentury. Yugimamunivar mentioned the following symptoms, blood clot in the urinary bladder

due to urinary tract disease followed by distension of urinary bladder, urinary stone formation in urinary tract by deranged humour of Vatham and Pitham.

நாட்டமாய் கற்பழித்துக் கடனைவாங்கி
நலிபண் ணிக்கொடாமல் வழக்குபேசி
கூட்டமாய் குருவுடைணகடமைதன்னைக்
கொடாமலேகைக் கொண்ட கொடுமை யோர்க்கும்
வாட்டமாய் வரம்புதப்பிதிரிந்தபேர்க்கும்
மாறுபாடாயெடுத்துப் பொருள் கடன்
காட்டியேகைக் கொண்டுக படுபண்ணும்
காலாந்தர் கல்லடைப்பிற் கலங்குவாரே

-யூகிவைத்தியசிந்தாமணி

The above mentioned poem explains immoral behaviours, anger and robbery causes derangement of three vital humours resulting in Kaladaippu.

According to Siddha maruthuvangachurukkam,

"நீரினைத் தடுத்தல் செய்யின்
நீர்க்கட்டுத் துவாரம் புண்ணாம்
பாறிடுஞ் சந்து சந்தில்
பண்புறு நோவ தாகும்
நேரிலங் கயருங் காமியம்
நிச்சய நோதல் செய்யும்
பாரினில பான வாயு
பண்புறச் சேரு மன்றே"

- சித்தமருந்துவாங்கச் சுருக்கம்

Siddha maruthuvanga churukkam explains that urination is one of the 14 visceral reflexes. When one suppresses this visceral reflex causes the inflammation of bladder, anuria, arthralgia, pain in the genital region and derangement of keezhnokkum kaal leads to the formation of calculus.

"சுக்கிலந் தனையடக்கின்
சுரமுடனீர்க் கட்டாகும்
பக்கமாங் கைகால் சந்து
பாரநோய் வழியி றங்கும்
மிக்க மார்நோயு ண்டாகும்
மிகுந்திடும் பிரமேகந்தான்
தக்கதோர் போதுமாகின்
தரித்திடும் வாயுக் கூறே"

- சித்தமருத்துவாங்கச் சுருக்கம்

The author also explains that ejaculation of semen is one of the 14 visceral reflexes. When one suppresses this visceral reflex, it causes fever, retention of urine which favours urinary calculi, chest pain, arthralgia and white discharge.

According to Noi Vilakkam

கருநீரடக்ககல் விரையில் அடிபடல்
நீரியந்தாக் கல் சிறுநீரடக்கல்
வளிநோய் மிருக்குமுணவும் ஒழுக்கமும்
கடைப் பித்திடுதல் மேகமுதற் பல
பிணியுறல் எழுமிவை யடிப்படையாகக்
கல்லடைப்பு யென்னுங் கடும்பிணி விளையும்
வளியது மீறியே யொடு மல்லாது
கருநீ ரொடுங் கலந்து நீரகத்துச்
சிறுநீர்க் கழிவு தொடுத்தலாலும்
அன்னவை கல்லெனத் திரளுமென்ப

- நோய் விளக்கம்

- Trauma on testes
- Controlling of urination
- Vatham aggravating foods
- Syphilis(Mega Noi)

Classification

Classification of kalladaippu In **Yugi Vaithiya Chinthamani**:

தோன்றினதோர் நாலினிடநாமங் கேளாய்
சுறுக்கான வாதத்தின் கல்ல டைப்பு
பூன்றியதோர் பித்தத்தின் கல்ல டைப்பு
புரண்டதோர் சேத்துமத்தின் கல்ல டைப்பு
தோன்றியதோர் தொந்தமாங் கல்லடைப்பு
தேகத்திற் பற்றியேசி றிது காலம்
தான்றியே சலப்பையில் வந்தி ழிந்து
சருவியே லிங்கத்திற்ற ரிக்குந் தானே

- **யூகிவைத்தியசிந்தாமணி (பா.எண் : 728)**

There are four types of Kalladaippu according **to Yugi Vaithiya Chinthamani**

1. ValiKalladaippu
2. Azhalkalladaippu
3. IyyaKalladaippu
4. ThonthaKalladaippu

வாதகல்லடைப்பு

தரித்து நாபிக்குங்கீழ் சுருக்காய் குற்றிச்
சலமலந்தான் வீழாமற் றம்பமாகி
வரித்துமே லிங்கத்தில் வலியுமாகி
மருவியதோர் பொத்தியெலாஞ் சுரந்துகட்டி
திரித்தியே கிடைகொடாப் பிரட்ட லாகித்
தேம்பியே மூச்சுமாய் வயிறு முப்பும்
உரித்ததோர் சதைபோல உவர்ப்பு மாகும்
ஓங்கிய தோர் வாதக்கல் டைப்பு தானே

- **யூகிவைத்தியசிந்தாமணி (பா.எண் : 729)**

In valikalladaippu, pain is felt just below the umbilical region and penis. It is characterized by severe colic pain, dyspnoea, abdominal distension, oliguria and constipation.

பித்தகல்லடைப்பு

அடைப்பாகிச் சலந்தானு மருவ லாகி
அயங்காச்சிச் சொருகினாற் போலே காணும்
புடைப்பாகப் பொற்றியெங் கும்பு ழுக்கமாகிப்
பூட்டுபோல் பிகுவாகிப் பிரட்டலாகும்
மடைப்பாகி உதிரநிற மாய்க்கல் லாகி
வந்திழிந்து லிங்கத்தில் மாட்டிக் கொள்ளும்
குடைப்பாகி குற்றலாய்க் கூச்சலாகிக்
குதட்டுமே பித்தக்கல் லடைப்பு தானே

-யூகிவைத்தியசிந்தாமணி (பாடல் எண் : 730)

Azhalkalladaippu is characterized by, reduced urine output with characteristic burning sensation similar to introducing a red-hot needle into the urethra, blood stained stones which blocks the ureter causing pricking pain and tenderness.

சேத்துமகல்லடைப்பு

தூனான தொப்புளிலே வில்லு போலச்
சலியாமற் சுரந்துமே சற்றே குற்றும்
ஏனானகாலோடு கைகள் சந்து
இடுப்புதான் குடைச்சலாயிசிவு காணும்
வேனான லிங்கத்தின் வெண்மை தன்னில்
விறுவிறென் றேகடுப்பாகி வியர்வை யாகம்
தேனான வெளுப்புக்கல் சிறுகல் லாகச்
சிக்கலாய் வந்திறங்குச் சேட்பந் தானே

-யூகிவைத்தியசிந்தாமணி (பா.எண் : 731)

Iyyakalladaippu is characterized by excruciating pain in the umbilical region, pain in the joints of upper and lower extremities, Low-backache, spasmodic pain, Sweating and gradual passing out of white coloured stone crystals in the urine.

தொந்தகல்லடைப்பு

வந்திறங்கும் நீர்த்தாரை யடியிற் றானும்
மாவருத்த முண்டாகி வலியு மாகி
நொந்திறங்கி நீர்தானு மருவி பாயும்
நொய்தான சிறுமணல் போல் நொறுங்கிக் கல்லான்
சந்திறங்கி நீர்வழியில் வந்து வீழும்
தாக்கான சிறங்கைக்கல் தினமொன் றுக்கு
துந்திறங்கித் தினந்தினமு மிழந்து கொல்லும்
தொந்தமாங் கல்லடைப்புச் சூட்டிடாயே.

- யூகிவைத்தியசிந்தாமணி (பா.எண் : 732)

In thonthakalladaippu, severe pain is felt just below the urethral region with excess urination.It is characterized by disintegration of stones in to small, sand like granules in the urine.

Classification according to NoiVilakkam

“வளிமுதல் மூன்றினுந் தோன்றலாலும்
கருநீர் தோன்றலாலும்
கல்லடைநால் வகைப் படுமென மொழியே”

-நோய் விளக்கம்

There are four types of kalladaippu

1. Vali kalladaippu
2. Azhal kalladaippu
3. Iyya kalladaippu
4. Karuneer kalladaippu

வளி கல்லடைப்பு (Vali kalladaippu)

“ படர்மிகப் படுத்தல் பற்கள் பிசைதல
நடுங்கல் உந்தியும் குறியும் பிசைதல்
கசடுகீழ் சளியொடுகழலல் அழுதல்
சிறுநீர் துளித்தல் என்பவும் பிறவும்
வளியின் கல்லடைக் குறியெனமொழிய்

கறுத்துஞ் சிவந்தும் முனைகள் பரந்தும்
வளியின் கல்லதுவடிவுனுமென்ப”

- Tongue biting, palpitation and shivering
- Lower abdominal colic and pain in the external genitalia
- Dribbling of urine, the stones are blackish red in colour

அழல் கல்லடைப்பு(Azhal kalladaippu)

‘‘சுட்டெனநீரியம் மிகவெதும்பிடுதலும
நோதலும் அவைக் கல்லடைக்குறியே
சிவந்துங் கறுத்து மஞ்சளாகியும்
சேங்குரு வடிவில் கல்லது தோன்றும்”

- நோய் விளக்கம்

- Burning micturition, dysuria
- Passing reddish black or yellow coloured stones

ஐயகல்லடைப்பு(Iyya kalladaippu)

‘‘நீரியங் குத்தல் திணித்தல் குளிர்த்தல்
எனுமிவை ஐயக் கல்லடைக் குறியே
வெளுத்தும் தேனிறமாகிய மொளிர்ந்தும்
பெரு வடிவுடையத்தாம் ஐய கல்லடைப்பு”

-நோய் விளக்கம்

- Pricking pain with severe intensity when passing urine
- Fever with rigors
- White or honey coloured shining or iuminant large size stone expelled.

கருநீர் கல்லடைப்பு (Karuneer kalladaippu)

‘‘கரு நீர்க்கல்லின் வளி சினந்தெழுந்து
விரைகளி னடுவில் அதுதனைத் தடுத்தலின்
கருநீர்க் கல்லடை மருவிடு மென்ப
நீரியம் நோதல் சிறுநீர் தடைபடல்
விரை வீங்கியிருத்தல் எனுமிவை பிறவும்

கருநீர்க் கல்லடைக் குறியென மொழிய
கருநீர்க் கல்லினை வளியது முடுகிச்
சிறியவும் பெரியவுந் துண்டுகளாக நொறுக்கிடும்
அவை சிறுநீர் வழி வெளிப்படவாகும்
அவை சிறுநீரினைத் தடுத்தல் நிற்கும்
சாற்றிய நீரினைத் தடுத்து நிற்பின்
ஆற்றல் குறைதல் வயிறு நோதல்
சுவைகெடல் வெளிறு மறுப்பு நீர்வேட்கை
வெல்வளி யெனுமிவை விளைந்திடு மெந்ப...

- நோய் விளக்கம்

- Sudden or gradual obstruction to flow of urine
- Excessive Valikutram breaks the stones into small and large size crystals and expels along with urine, sudden stoppage of urine stream
- Retention of urine, abdominal pain, loss of taste, excessive thirst

In **Dhanvanthirivathiyam**, Kalladaippu is classified into four types, they are

1. Kallerippan
2. Pithaachamari
3. Silethumaachmari
4. Sukilaachmari

In **SiddharAruvaiMaruthuvam**, Klladaippu is classified into four types, they are

1. Valikalladaippu
2. Azhalkalldaippu
3. Iyyakalladaippu
4. Venneerkalladaippu

Classification in**Jeevaratchamirtham**and **Anubhavavaithiyadevaragasiyam**:

Types of Kalladaippu:

1. Vathaachmari
2. Pithaachmari
3. Kabhaachmari
4. Shukilaachmari
5. Swagaraachmari

Differential Diagnosis of Kalladaippu

உக்கார சூலை

"குத்து முக்கார சூலை யின்கு ணந்தான்
கோர்வையாய் விலாவதனில் முதுகில் நெஞ்சில்
அத்தி யினில் நாபியில பானமாங்கு தத்தில்
அதிக துன்மாங்கிசந்தான் வரை மேவிப்
பத்துமணற் படுக்கைப் போற் சலத்து வாரப்
பதிநெருக்கி மூத்திரமாங் கிரிச்சி யுண்டாய்த்
தத்துசடங் கடுப்பெடுத்து மதிக லங்கித்
தளர்ச்சி யொடு மயக்ககமாய்த் தள்ளுந் தானே"

-யூகி வைத்திய சிந்தாமணி (பா. எண் 233)

Excessive growth of muscles in chest region, back of trunk, umbilicus, anal and urethral orifice followed by structure of urethral orifice like a sand like crystals blocked in urethra, dysuria, body pain, tiredness and giddiness occurs.

Mukkutra verupaduakal (Siddha pathology)

The imbalance in one's food and fluid intake increases the Azhalkutram. This raised kutram dries up the body fluid and urine resulting in concentration of salts, this further affects the Keezh nokku kaal. One of the functions of the keezh nokku kaal is to excrete urine so when this Keezh nokku kaal is affected, the urine will be obstructed within urinary tract. This favours the deposition of urinary salts to develop into calculi anywhere in the kidney or urinary salts to develop calculi anywhere in the kidney or urinary tract.

Diagnostic methodology:

The Diagnostic methodology in siddha system is unique as it is made purely on the basis of clinical acumen of the physician. The diagnosis is arrived from,

- Poriyal arithal (Inspection)
- Pulanal arithal (Palpation)
- Vinaathal (Interrogation)
- Envagaithervu (eight fold examination)

Pulanal arithal

The physician should examine the patient's pulangal by his Porigal & Pulangal

- Hearing-Ear
- Vision-Eye

- Taste-Tongue
- Sensation-Skin
- Smell-Nose

Poriyal aridhal:

The Physician should examine the patient's porigal by his porigal

- Mei- To feel all types of sensation
- Vaai-For knowing taste
- Kan- for Vision
- Mooku- For knowing the smell
- Sevi- For hearing

Vinaadhal (Interrogation)

The physician should interrogate the patient's name, age, occupation, native place, Socio economic status, dietary habits, present complaints, history of present illness, aggravating factors, history of previous illness etc.

Envagai thervugal:

"நாடி பரிசம் நாநிறம் மொழிவிழி
மலம் மூத்திரமிவை மருந்துவராயுதம்"

-தேரையர்

"அகந்துறு நோயை கரத்தாம லகம்போல்
பகுத்தறிவீர்நாடிப் பரிசம் -தொகுத்த நிறம்
கட்டுவகைச் சொல் மொழி கண்ட மல மூத்திரம் நா
எட்டுவகை யாலு மறிவீர்"

அகத்தியர் வைத்திய சிந்தாமணி வெண்பா 4000

` "மெய்குறி நிறந்தொனி விழிநாவிருமலம் கைக்குறி"

-தேரையர்

According to **Agatiyar Vaithiya Sinthaamani Venba - 4000**, and saint Therayar the envagaithervu(Eight types of diagnostic tools) includes Nadi (Pulse), Naa (Tongue), Niram (Colour), Mozhi(Voice), Vizhi(Eyes), Malam (Faeces), Neer(Urine) and Sparisam(Touch & Palpation).

Naadi: (Pulse)

The ‘Pluse diagnosis’ is a unique method in Siddha medicine. The pulse should ne examined in the right hand for male and the left hand for female. The pulse can be recorded at the radial artery. By keenly observing the pulsation, the diagnosis of diseases well as its prognosis can be assessed clearly.

" கேளப்பா புருடருக்கு வலது கையைக்
கிருபையுடன் தான்பிடித்து நெட்டை வாங்கி,
சூளப்பா பெருவிரலோ ரங்குலத்துக் கப்பாற்
சுகமாக மூவிரலா லழுத்திப் பார்க்க”

-பரிபூரண நாடி

" பார்க்கவே பெண்டுகளுக் கிடது பக்கம்”

- பரிபூரண நாடி

Naadi is nothing but the manifestation of the vital energy that sustains the life within ourbody. Naddi plays a most important role in Envagai thervu and it has been considered as foremost thing in assessing the prognosis and diagnosis of various diseases. Any variation that occurs in the three humours is reflected in the Naadi. These three humours organize, regularize and integrate basic functions of the human body. So, Naadi serves as a good indicator of all ailments. Aggravation of valinaadi and azhal naadi produces symptoms of Kalladaippu. This is emphasized in **Agathiyar naadi, Sathaga naadi, and Rathina churukka naadi**

"அறைந்தோம் வாதரோகியுடல்
அடிகண் முகமும் பலமலமும்
நிறைந்த விழியில் நீர்வடியும்
நீண்ட நாவு கறுத்திடவும்
நிறைந்த முள்ளாய் தானிருக்குஞ்
சிறுநீர் பொருமி கருத்து வரும்
உறைந்த நீருங்கரு கருத்து
முறையாய் ரோகமு முண்டாய்”

-அகத்தியர் நாடி

வாத மெனும் நாடியது தோன்றில்
சீதமந்தமொடு வயிறு பொருமல் திரட்சிவாயு

சீதமுருங் கிராணி மகோதரம் நீராமை
திரள்வாயு சூலை வலிக்கடுப்புத்தீரை
நீதமுருங் கிருமிகுன்மம் அண்டவாதம்
நிலையங்நீர்க் கரிச்சரங்கள் தந்து மேகம்”

- சதக நாடி

“ ஏவலாய் குழலாய் பித்த செய்குணம் விளம்பக் கேளாய
கோல்வேல் விழிசிவந்து குறிர்ந்திருக்கு மல்லமால்
சீலவே நீர்கடுத்து நொந்து சுருக்கென வந்துவீழும்
ஞாலமே கிறுகிறென்ற நாவுலர்ந்திருக் குந்தானே”

- இரத்தினச் சுருக்க நாடி

As per Sathaga naadi Derangement of Valiazhal naadi also produces symptoms of Kalladaippu.

பொருளான வாதத்தில் பித்தஞ் சேர்ந்து
பொருந்து குணங்களா முஷ்ணவாயு சத்தி
செரியாமை புளித்தேப்பம் பொருமல் நீரிற்
சிவப்புமலம் பிடித்தலுருந் தாது நட்டம்”

- சதக நாடி

Sparisam (Touch):

By sparisam, the temperature of the skin (thatpam-cold or veppam-hot), smoothness, roughness, sweating, dryness, hard parches, swelling, abnormal growth of organs and tenderness can be felt. In Kalladaippu patient feels tenderness over the lower abdomen renal angle and lumber region. Swelling can be felt in the case of hydronephrosis.

Naa (Tongue)

By the examination of the tongue its colour, size coating, moisture, movement, ulcer, fissure, crust can be examined in kalladaippu

“கருநீர்கல்லின் வளி சினந்தெழுந்து
சுவைகெடல் வெளிறு மறுப்பு நீர்வேட்கை”

- நோய் விளக்கம்

Niram (colour)

- Colour of the skin, conjunctiva, tongue, nail bed and hair etc.
- Vali udal-dark complexion
- Azhal udal- wheatish yellow complexion
- Iyya udal - Fair complexion

Mozhi (Speech):

By examining mozhi (speech), the various characters are to be noted such as hoarseness, slurring etc., and various disorders of speech such as dysarthria can also be noted in kalladaippu. There is low pitched voice due to agonizing pain in the lower abdomen and burning sensation in urethra.

VizhiEye):

Examine the colour ofconjunctiva whether reddish or yellowsih dicolouration and characters like dryness and lacrimation.

Malam (Stool):

By examining malam, its nature (consistency), colour, quantity and presence of blood can be noted.

Neerkuri (Urine Examination):

Urine examination is one of the good diagnostic tool when compared to other Envagai thervugal.

நீர்குறிச் சிறப்பு:

"தர்க்கசாத் திரிக ளானோர்
தங்களிற் றேர்ந்து நாடி
வர்க்கமாம் நாடி தன்னில்
வருவது மயக்க மென்றே
உற்றநீர்ப் பரீஷை யாய்ந்தே
யுரைத்தன ரிதற்கு நேராய்
மற்றொரு விதிநூ லில்லை
மருத்துவக் கலைவலலோர்க்கே"

- அங்காதி பாதம்

The exponents have charted out a method called Neerkuri- an incomparable method of diagnosis

" அருந்துமா ரதமும் அவிரோ தமதாய்
அ.ஃகல் அலர்தல்அகாலவூண் தவிர்த்தழற்
குற்றள வருந்தி உறங்கி வைகறை
ஆடிக் கலசத் தாவியே காதுமெய்
தொருமுகூர்த் தக்கலைக் குட்பட்டு நீரின்
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே"

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

On the day before the urine test one should have food consist of all the six tastes in an harmonious blend at regular time interval based on one's digestive fire(appetite) after a sound overnight sleep. Urine should be collected in a crystal bowl and the test should be done 90 minutes before dawn.

Characters of urine:

"வந்த நீர்க்கரி எடை மணம் நுரை எஞ்சலென்
றைந்திலுளவவை யறைகுது முறையே"

- **தேரையர் நீர்க்குறி நெய்குறிவைத்தியம்**

1. Niram (Colour)
2. Edai(Specific gravity)
3. Nurai (Froth)
4. Naatram(Smell)
5. Enjal (Deposits)

Urine sample should be examined for the above mentioned five parameters

Niram (Colour)

Nira thogai:

"பீதம் செம்மைபைங் கருமை வெண்மையென்
றோதைங் கொழுமையை யொத்துகு நீரே"

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

1. Yellow
2. Red
3. Green
4. Black
5. White

Urine may be of any Colour mentioned above according to the disease condition.

கல்லடைப்பு நீரின் குணம் (Colour indicating urinary stones):

The colour of the urine look like decomposed flesh cleaned water indicates the presence of kidney stone

"தீப்புலால் கழுநீர்ச் செயலெனிர் குண்டிக்
காய்த்துர்ப் பலத்தால் கதித்த நீராமத்
துர்ப்பலக் கபமும் சோரியும் கொதிப்புறப்
பற்பகலாகப் பையப் பதிந்ததே"

-தேரையர் நீர்க்குறி நெய்குறி வைத்தியம்

"காணிதில் சீழும் கலந்திழி மணமுறின்
கருப்ப நாபிகளுங் காம நாளத்துளும்
விரணமுன் டின்றேல் எய்துகல் மறியல
திருத்தலே திண்ண மெனமனத் துன்னெ"

- தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

Edai(Specific Gravity):

Urine which is not thick is considered to be healthy one.

"மிகத் தடிப்பும் மிகத் தேறலும் இன்றெனில்
சுகத்தைத் தரும் மெய்ச் சுபாவ நீர் நன்றே"

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

Nurai(Froth):

"பந்தமெய்ப் பசையிளகப்படும்பருவத்
தந்தார் பூதமாய் அனில மூத்திரத்தில்
சம்பந்தப்படும் ததிநுரைப் புனலே"

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

Urine may be frothy in nature, reduced froth in the urine indicates derangement of Vali, Azhal and Iyyam.

Naatram (Odour):

"ஒதமணத்தோ டவதோ மொத்தி றங்கும்
சீதளங் கம்மிய தேகிகளுக்கே
வெய்ய துர்க்கந்தம் வீசு நீர் முத்திரப்
பைநாளமிற்றைப் பற்று புண்குறியே

அம்மொழியின்றெனினனிலமே முதலிய
மும்மலச் சுதமெ மூலமன் றுணரே”

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

Enjal (Deposits):

If the colour of the urine excreted looks like curd water or milk and the presence of white colour and sand like deposits in urine indicates stones in the kindney. It is mentioned in the following poem,

“நார்த்ததி நீர்பால் போல
நவையுற்ற கிழிவு மானால்
மாரற்ப முற்றா நீரிலடி
லடி மண்டிக் கிடந்த தானால்
பரித்த மெழுகு மாங்காய்
பற்றிய கல்லி நாலே
சீருற்ற செய்கை யென்று
தெரிவுறச் செப்ப லாமே”

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

Neikkuri:

The urine was kept in the kidney tray and exposed to sunlight under non wind condition. The urine should be examined after dropping a drop of gingelly oil gently in it with a glas rod. If the oil spreads like snake, it indicates Valineer, like a ring indicates Azhal neer, and float like pearl indicates Iyya neer and if it sinks in urine, it indicates mukkutram.

“நிறக்குறிக் குரைத்த நிருமாண நீரிற்
சிறக்க வெண்ணெய்யோர் சிறுதுளி நடுவிடுத்
தென்றுறத் திறந்தொலி ஏகாதமைத்ததி
னின்றதிவலை போம் நெறிவிழியறியும்
சென்றது புகலுஞ் செய்தியை யுணரே”

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

"அரவென நீண்டின .ஃதே வாதம்"

"ஆழி போற் பரவின் அ.ஃதே பித்தம்"

"முத்தொத்து நிற்கின் மொழிவதென் கபமெ"

-தேரையர் நீர்க்குறி நெய்க்குறி வைத்தியம்

In kalladaippu patients, either oil spreads like a ring (azhal neer) or like a snake (vali neer).

சாத்திய அசாத்தியம்: (Prognosis)

சூட்டிய சாத்தியத்தைச் சொல்லக் கேளாய்
சுருக்காகும் வாதத்தின் கல்லடைப்பு
பூட்டிட்ட பித்தத்தின் கல்ல டைப்புப்
புகழான சேட்டுமத்தின் கல்லடைப்பு
மூட்டிட்ட இதுமூன்று மாசத்ய மாகி
முயான மருந்துகளிற் செம்மை யாகும்
தோட்டிட்ட தொந்தமாங் கல்ல டைப்புத்
தொடுசுறவே கொல்லுமிது தானே

- யூகி வைத்திய சிந்தாமணி

According to Yugi mamunivar, Vali, Azhal and Iyya kalladaippu are curable whereas Thontha kalladaippu is incurable.

மருத்துவம் (Line Of Treatment)

"வைத்தியச் செயல் வைத்தியமே"

-திருமூலர் 800

The main object of treatment is to bring down the deranged mukkutrams to equilibrium by giving purgatives, which cure derangement of vatham, one of the cause for kalladaippu.

"பேதியால் வாதம் தாழும்"

"வாந்தியால் பித்தம் தாழும்"

" அஞ்சனத்தால் கபம் தாழும்"

-வியாச பகவான் சரீர சூத்திரம்

As per the above mentioned poem, the author gave Agasthyar Kuzhambu 130 mg with sangankuppi leaves juice as purgative drug to all patients as per their body constitution.

In Siddha system, treatment is not only for treating the disease but also for preventing and improving the body condition

Diet:

"மருந்தே உணவு, உணவே மருந்து"

- திருமூலர்.

"மாறுபா டில்லா உண்டி மறுத்துண்ணின்
ஊறுபா டில்லையு யிர்க்கு"

- திருக்குறள்.

Do's

- Drink 3 to 4 litres of water per day.
- Take more amount of barley rice porridge, tender coconut, stalk of the greens, spadix of the plaintain, kollu kudineer.
- Fruits: water melon, cucumber, pineapple, lemon, guava
- Cereals: dal, black gram, green gram, dried pea
- Vegetables: radish, broad beans, lady's finger, bottle guard, white pumpkin.
- Seeds: cumin seed, cucumber seed.

Dont's

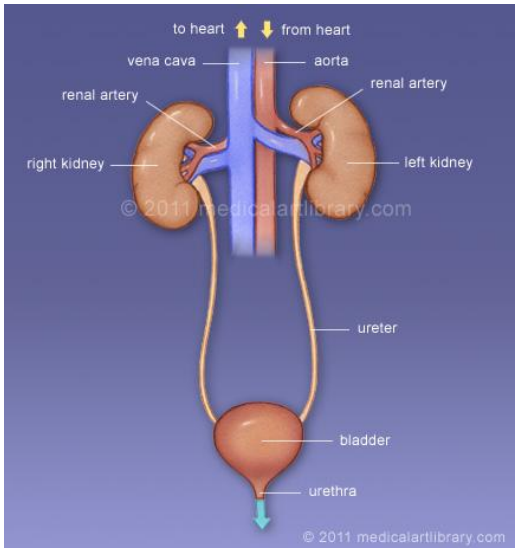
- Tomato, cabbage, cauliflower, coffee, tea chocolate, meat greens, egg, grapes, strawberry, caustic soda, tamarind, betle, areca nut, tobacco, liquor.
- Preserved beverages, foods rich in salts, salty water, milk and milk products spicy and fried foods.

ANATOMY KIDNEYS

Kidneys are a pair of excretory organs situated on the posterior abdominal wall, behind the peritoneum, one on each side of the lumbar part of the vertebral column. The upper pole of the left kidney reaches the 11th rib while the upper pole of the right kidney reaches the 11th intercostal space.

Shape and size

Each kidney is bean-shaped and has two poles, upper and lower, two borders, medial poles, upper and lower, two borders, medial and lateral and two surfaces anterior and posterior. Each Kidney is 7.5 cm in length, 5 cm in breadth and 2.5 cm in thickness. Each Kidney weighs about 120 to 150 gm



Renal fat and fascia

The kidneys are enclosed in and associated with a unique arrangement of fascia and fat. Immediately outside the renal capsule, there is an accumulation of extraperitoneal fat–the perinephric fat (perirenal fat), which completely surrounds the kidney Enclosing the perinephric fat is a membranous condensation of the extraperitoneal fascia (the renal fascia). The suprarenal glands are also enclosed in this fascial compartment, usually separated from the kidneys by a thin septum. The renal fascia must be incised in any surgical approach to this organ.

At the lateral margins of each kidney, the anterior and posterior layers of the renal fascia fuse This fused layer may connect with the transversalis fascia on the lateral abdominal wall.

Above each suprarenal gland, the anterior and posterior layers of the renal fascia fuse and blend with the fascia that covers the diaphragm.

Medially, the anterior layer of the renal fascia continues over the vessels in the hilum and fuses with the connective tissue associated with the abdominal aorta and the inferior vena cava. In some cases, the anterior layer may cross the midline to the opposite side and blend with its companion layer.

The posterior layer of the renal fascia passes medially between the kidney and the fascia covering the quadrates lumborum muscle to fuse with the fascia covering the psoas major muscle.

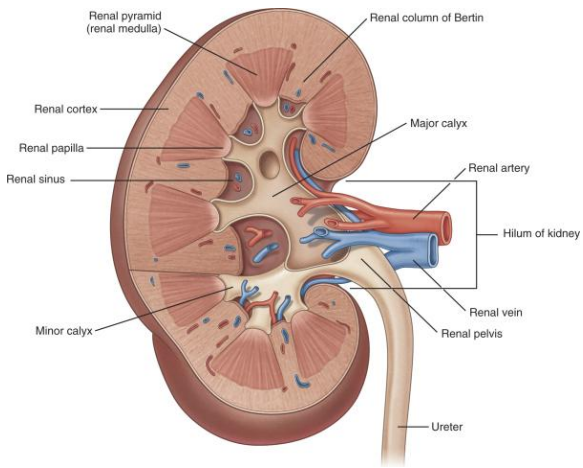
Inferiorly, the anterior and posterior layers of the renal fascia enclose the ureters.

In addition to perinephric fat and the renal fascia, a final layer of paranephric fat (pararenal fat) completes the fat and fascias associated with the kidney. This fat accumulates posterior and posterolateral to each kidney.

Kidney structure

Each kidney has a smooth anterior and posterior surface covered by a fibrous capsule, which is easily removable except during disease.

On the medial margin of each kidney is the hilum of kidney, which is a deep vertical slit through which renal vessels, lymphatics, and nerves enter and leave the substance of the kidney Internally, the hilum is continuous with the renal sinus. Perinephric fat continues into the hilum and sinus and surrounds all structures.

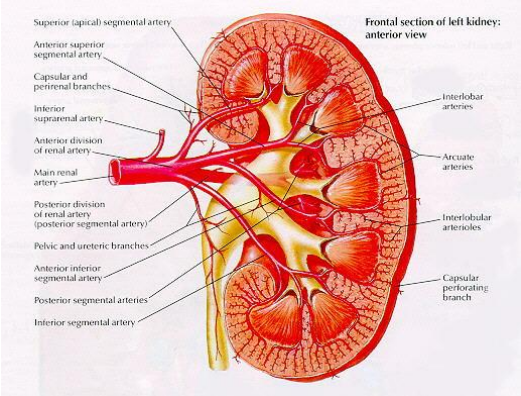


Each kidney consists of an outer renal cortex and an inner renal medulla.

The bases of the renal pyramids are directed outward, toward the renal cortex, while the apex of each renal pyramid projects inward, towards the renal sinus. The apical projection (renal papilla) is surrounded by a minor calyx.

Renal vasculature and lymphatics

A single **large renal artery**, a lateral branch of the abdominal aorta, supplies each kidney.



As each renal artery approaches the renal hilum, it divides into anterior and posterior branches, which supply the renal parenchyma. Accessory renal arteries are common. They originate from the lateral aspect of the abdominal aorta, either above or below the primary renal arteries, enter the hilum with the primary arteries or pass directly into the kidney at some other level, and are commonly called extrahilar arteries.

Multiple renal veins contribute to the formation of the left and right renal veins, both of which are anterior to the renal arteries.

The lymphatic drainage of each kidney is to the lateral aortic (lumbar) nodes around the origin of the renal artery.

Ureters

The ureters are muscular tubes that transport urine from the kidneys to the bladder.

Dimensions

Each ureter is about 25 cm. (10 inc) long of which the upper half (5 in) lies in the abdomen and the lower half (5 in) lies in the pelvis. It measures about 3mm in diameter hut it is slightly constituted at three places.

They are continuous superiorly with the renal pelvis, which is a funnel-shaped structure in the renal sinus. The renal pelvis is formed from a condensation of two or

three major calices, which in turn are formed by the condensation of several minor calices. The minor calices surround a renal papilla.

Ureteric vasculature and lymphatics

The ureters receive arterial branches from adjacent vessels as they pass towards the bladder.

- The renal arteries supply the upper end;
- The middle part may receive branches from the abdominal aorta, the testicular or ovarian arteries, and the common iliac arteries;
- In the pelvic cavity, the ureters are supplied by one or more arteries from branches of the internal iliac arteries.
- In all cases, arteries reaching the ureters divide into ascending and descending branches, which form longitudinal anastomoses.
- Lymphatic drainage of the ureters follows a pattern similar to that of the arterial supply. Lymph from:
- The upper part of each ureter drains to the lateral aortic (lumbar) nodes;
- The middle part of each ureter drains to lymph nodes associated with the common iliac vessels.
- The inferior part of each ureer drains to lymph nodes associated with the external and internal iliac vessels.

The complications of urinary tract stones include infection, urinary obstruction, and renal failure. Stones may also develop within the bladder and produce marked irritation, causing pain and discomfort.

The diagnosis of urinary tract stones is based upon history and examination. Stones are often visible on abdominal radiographs. Special investigations include:

- Ultrasound scanning, which may demonstrate the dilated renal pelvis and calices when the urinary system is obstructed; and
- An intravenous urogram, which will demonstrate the obstruction, pinpoint the exact level, and enable the surgeon to plan a procedure to remove the stone if necessary.

URINARY BLADDER

Introduction

Urinary bladder is the temporary store house of urine which gets emptied through the urethra. The urinary bladder is a muscular reservoir of urine, which lies in the anterior part of the pelvic cavity.

Size, Shape and Position

The bladder varies in its size, shape and position according to the amount of urine it contains. When empty it lies within the pelvin. But as it fills it extends upwards into the abdominal cavity reaching upto the umbilicus or even higher.

External Features

An empty bladder is tetrahedral in shape and has : (a) An apex, directed forwards; (b) a base or fundus, directed backwards; (c) a neck, which is the lowest and most fixed part of the bladder; (d) three surfaces, superior, and right and left inferolaternal; and (e) four borders, two lateral, one anterior and one posterior.

Ligaments of the Bladder

True Ligaments

These are condensations of pelvic fascia around the neck and base of the bladder. They are continuous with the fascia on the superior surface of the levator ani.

1. The lateral true ligament
2. The lateral puboprostatic ligament
3. The medial puboprostatic ligament
4. The median umbilical ligament
5. The posterior ligament

False Ligaments

These are peritoneal folds, which do not form any support to the bladder. They include: (1) The median umbilical fold; (2) The medial umbilical fold; (3) The lateral false ligament (4) The posterior false ligament.

Interior of the Bladder

It can be examined by cystoscopy, at operation or at autopsy.

In an empty bladder, the greater part of the mucosa shows irregular folds due to its loose attachment to the muscular coat.

In a small triangular area over the lower part of the base of the bladder, the mucosa is smooth due to its firm attachment to the muscular coat. This area is known as the *trigone* of the bladder. The ureters open at the posterolateral angles of the trigone.

Their openings are 2.5 cm apart in the empty bladder, and 5 cm apart in a distended bladder.

Capacity of the Bladder

The mean capacity of the bladder in an adult male is 220 ml, varying from 120 to 320 ml. Filling beyond 220 ml causes a desire to micturate, and the bladder is usually emptied when filled to about 250 to 330 ml. Filling upto 500 ml may be tolerated.

Arterial Supply

1. The Superior and inferior vesical arteries, branches of the anterior trunk of the internal iliac artery.
2. Obturator, and inferior gluteal arteries and in females from the uerine and vaginal arteries instead of inferior vesical.

Venous Drainage

Drain into the internal iliac veins.

Lymphatic Drainage

Most of the lymphatics from the urinary bladder terminate in the external iliac nodes. A few vessels may pass to the internal iliac nodes or to the lateral aortic nodes.

Nerve Supply

The vesical plexus contains both sympathetic and parasympathetic components, Each of which contains motor or efferent and sensory or afferent fibres.

1. *Parasympathetic efferent* fibres or Nervi erigentes, S2, S3, S4 are motor to the detrusor muscle and inhibitory to the sphincter vesicae. If these are destroyed, normal micturition is not possible.
2. *Sympathetic efferent* fibres (T11 to L2) are said to be inhibitory to the detrusor and motor to the sphincter vesicae. Many workers regard them to be chiefly vasomotor.
3. The somatic, *pudendal* nerve (S2, S3, S4) supplies the sphincter urethrae which is voluntary.
4. *Sensory nerves*: Pain sensations, caused by distension or spasm of the bladder wall, are carried mainly by parasympathetic nerves and partly by sympathetic nerves. In the spinal cord, pain arising in the bladder passes through the *lateral spinothalamic tract*, and awareness of bladder distension is mediated through the *posterior columns*.

THE MALE URETHRA

Definition

Male urethra is a membranous canal for the external discharge of urine and seminal fluid.

The male urethra is 18 to 20 cm long.

External and Location

The urethra extends from the internal urethral orifice at the neck of the urinary bladder to the external urethral orifice at the tip of the penis.

Paris of the Urethra

- The *prostatic part* passes through the prostate.
- The *membranous part* is surrounded by the sphincter urethrae.
- The *spongy* or *penile part* passes through the bulb and corpus spongiosum of the penis.

The length of the prostatic part is 3cm; that of the membranous part is 1.5 to 2 cm; and that of the spongy part is about 15 cm.

Sphincters of the Urethra

1. The *internal urethral sphincter* or *sphincter vesicae* is involuntary in nature. It is supplied by sympathetic nerves, from lower thoracic and upper lumbar segments of spinal cord.
2. The *external urethral sphincter* or *sphincter urethrae* is voluntary in nature. It is made up of striated muscle fibres and is supplied by the perineal branch of the pudendal nerve (S2 to S4)

Vessels and Lymphatics

The urethra is supplied by the vessels of the prostate and of the penis. The lymphatics from the prostatic and membranous parts of the urethra pass mostly to the internal iliac nodes and partly to the external iliac nodes. Those from the spongy part pass mostly to the deep inguinal nodes, but some may end in the superficial inguinal and external iliac nodes.

THE FEMALE URETHRA

1. The female urethra is only 4 cm long and 6 mm in diameter.
2. It begins at the internal urethral orifice, at the neck of the urinary bladder roughly 5 cm behind the middle of the pubic symphysis. It runs downwards and forwards embedded in the anterior wall of the vagina, traverses the urogenital diaphragm, and ends at the external urethral orifice in the vestibule.
3. The female urethra is easily dilatable, and catheters or cystoscopes can be easily passed through it.

PHYSIOLOGY

Renal Circulation

Blood is supplied to the kidney by the renal artery, which arises directly from abdominal aorta and enters the kidney through the hilus. While passing through renal sinus, the renal artery divides into many segmental arteries, which subdivide into interlobar arteries.

Each interlobar artery passes in between the medullary pyramids. At the base of the pyramid, it turns and runs parallel to the base of pyramid forming arcuate artery.

Each arcuate artery gives rise to interlobular arteries. The interlobular arteries run through the renal cortex perpendicular to arcuate artery. From each interlobular artery, numerous afferent arterioles arise.

The afferent arteriole enters the Bowman's capsule and forms glomerular capilliary tuft. The afferent arteriole divides into 4 or 5 large capillaries. Each large capillary divides into small capillaries, which form the loops. And, the capillary loops unite to form the efferent arteriole, which leaves the Bowman's capsule.

The efferent arterioles form a second capillary network surrounding the tubular portions of the nephrons. These second set of capillaries are called peritubular capillaries. Thus the renal circulation forms a portal system by the presence of two sets of capillaries – glomerular capillaries and peritubular capillaries.

The network of peritubular capillaries supplies the tubular portion of cortical nephrons are supplied by some specialized capillaries called vasa racta. Vasa recta arise directly from the efferent arteriole of the juxtamedullary nephrons and run parallel to the renal tubule into the medulla and ascend up towards the cortex.

The peritubular capillaries and vasa recta drain into the venous system, which includes the peritubular venules, interlobular veins, arcuate veins, interlobar veins, segmental veins and finally the renal vein .

Renal vein leaves the kidney through the hilus and joins inferior vana cava.

URINE FORMATION

INTRODUCTION

Kidneys excrete the unwanted substances including metabolic end products and those substances, which are present in excess quantities in the body, through urine.

Normally, about 1 to 1.5 liters of urine is formed everyday. The mechanism of urine formation includes various processes.

First, when blood passes through glomerular capillaries, the plasma is filtered into the Bowman's capsule. When this filtrate passes through the tubular portion of the nephron, it undergoes various changes both in quality and in quantity. Many wanted substances like glucose, amino acids, water and electrolytes are reabsorbed from the tubules. This process is called tubular reabsorption.

And, some unwanted substances are secreted into the tubule from peritubular blood vessels. This process is called tubular secretion or excretion.

Thus, the urine formation includes three processes:

I. Glomerular filtration

II. Tubular reabsorption

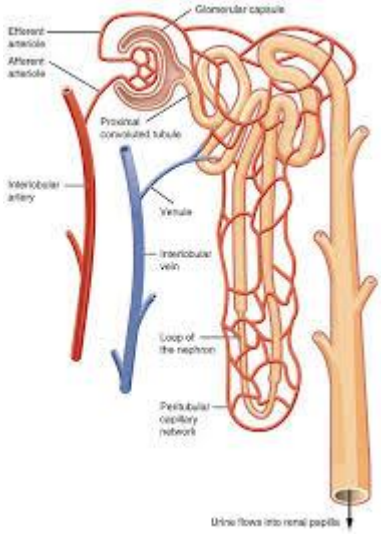
III. Tubular secretion.

GLOMERULAR FILTRATION

When the blood passes through the glomerular capillaries, the plasma is filtered into the Bowman's capsule. All the substances of plasma are filtered except the plasma proteins. The filtered fluid is called glomerular filtrate. During filtration, the substances pass through a filtering membrance which is formed by three layers of structures:

1. The endothelium of glomerular capillary membrane

2. Basement membrane
3. Epithelium in the visceral layer of Bowman's capsule.



The glomerular filtration is called ultrafiltration because even the minute particles are filtered. But, the plasma proteins are not filtered due to their large molecular size. The protein molecules are larger than the slit pores present in the endothelium of capillaries. Thus, the glomerular filtrate contains all the substances present in plasma except the plasma proteins.

GLOMERULAR FILTRATION RATE (GFR)

Glomerular filtration rate (GFR) is the total quantity of filtrate formed in all the nephrons of both the kidneys in the given unit of time.

The normal GFR is 125 ml per minute or about 180 liters per day.

FILTRATION FRACTION

The fraction (portion) of the renal plasma which becomes the filtrate is called filtration fraction. It is the ratio between renal plasma flow and glomerular filtration rate. It is expressed in percentage.

Thus filtration fraction $= \frac{\text{GFR}}{\text{Renal plasma flow}} \times 100$

$= \frac{125 \text{ ml/min}}{650 \text{ ml/min}} \times 100$

$= 19.2\%$

The normal filtration fraction varies from 15 to 20%

PRESSURES DETERMINING FILTRATION

The pressures, which determine the GFR, are:

1. Glomerular capillary pressue
2. Colloidal osmotic pressure
3. Hydrostatic pressure in the Bowman's capsule.

These pressures determine the GFR by either favoring or opposing the filtration.

1. *Glomerular Capillary Pressure*

It is the pressure exerted by the blood in glomerular capillaries. It is about 60 mmHg and, varies between 45 and 70 mmHg. Glomerular capillary pressure is the highest capillary pressure in the body. This pressure favors glomerular filtration.

2. Colloidal Osmotic Pressure

It is exerted by plasma proteins in the glomeruli. The plasma proteins are not filtered through the glomerular capillaries and remain in the glomerular capillaries. These proteins develop the colloidal osmotic pressure which is about 25 mmHg. It opposes glomerular filtration.

3. *Hydrostatic Pressure in Bowman's Capsule*

It is the pressure exerted by the filtrate in Bowman's capsule during filtration. It is also called capsular pressure. It is about 15 mmHg. It also opposes glomerular filtration.

4. Net Filtration Pressure

Net filtration pressure is the balance between pressure favoring filtration and pressures opposing filtration. It is otherwise known as effective filtration pressure or essential filtration pressure. It is very essential for the maintenance of GFR.

The net filtration pressure =

$$\text{Glomerular Capillary pressure} - \left\{ \text{Colloidal osmotic pressure} + \text{Hydrostatic pressure in Bowman's capsule} \right\}$$

= 60 – (25 + 15) = 20 mmHg, and, it varies between 15 and 20 mmHg.

The normal net filtration pressure is about 20 mmHg, and, it varies between 15 and 20 mmHg.

FACTORS REGULATING GFR

1. Tubuloglomerular Feedback

The GFR is constantly regulated through a feedback from renal tubule. Macula densa of juxtaglomerular apparatus is responsible for this.

When the glomerular filtrate passes through the terminal portion of thick ascending segment of renal tubule the macula densa acts like a sensor. It detects the concentration of sodium chloride and accordingly alters the blood flow and GFR.

When the concentration of sodium chloride increases in the filtrate, macula densa secretes thromboxane A_2. Thromboxane A_2 causes contraction of juxtaglomerular cells resulting in constriction of afferent arteriole.

2. Glomerular Capiliary Pressure

The GFR is directly proportional to glomerular capillary pressure. When glomerular capillary pressure increases, the GFR also increases. The capillary pressure, in turn depends upon the renal blood flow and arterial blood pressure.

3. Colloidal Osmotic Pressure

The GFR is inversely proportional to colloidal osmotic pressure which is exerted by plasma proteins in the glomerular capillary blood.

4. Hydrostatic Pressure in Bowman's capsule

GFR is inversely proportional to this also.

5. Renat Blood Flow

It is most important factor necessary for glomerular filtration, GFR is directly proportional to this.

6. Constriction of Afferent Arteriole

The constriction of afferent arteriole reduces the blood flow to the glomerular capillaries which in turn reduces GFR.

7. Constriction of Efferent Arteriole

If efferent arteriole is constricted, initially the GFR increases.

8. Systemic Arterial Pressure

It is responsible for flow of blood through various organs including kidneys. However, increase in mean arterial blood pressure up to 180 mmHg or reduction up to 60 mmHg does not alter the renal blood flow or GFR. It is due to the autoregulatory mechanism . Variation in pressure above 180 mmHg or below 60 mmHg affects the

renal blood flow and GFR accordingly because the autoregulatory mechanism fails beyond this range.

9.Sympathetic Stimulation

Afferent and efferent arterioles are supplied by sympathetic nerves. The mild or moderate stimulation of sympathetic nerves does not cause any significant change either in renal blood flow or GFR.

10. Surface Area of Capillary Membrane

GFR is directly proportional to the surface area of the capillary membrane.

11. Permeability of Capillary Membrane

GFR is directly proportional to the permeability of glomerular capillary membrane.

12. Contraction of Glomerular Mesangial Cells

Contraction of these cells decreases GFR.

13. Hormonal and Other Factors

Many hormones and other factors alter GFR by affecting the blood flow through glomerulus.

TUBULAR REABSORPTION

When the glomerular filtrate flows through the tubular portion of nephron, both quantitative and qualitative changes occur. Large quantity of water (more than 99%). electrolytes and other substances are reabsorbed by the tubular epithelial cells. The rabosorbed substances move into the interstitial fluid of renal medulla. And from here, the substances move into the blood in peritubular capillaries.

Since the substances are taken back into the blood from the glomerular filtrate, the entire process is called tubular reabsorption.

SELECTIVE REABSORPTION

The tubular cells of kidney selectively reabsorb the substances present in the glomerular filtrate, according to the needs of the body. The substances which are necessary for the body such as glucose, amino acids and vitamins are completely reabsorbed from renat tubule So, the tubular reabsorption is called the selective reabsorption

MECHANISM OF REABSORPTION

The basic transport mechanisms involved in tubular reabsorption are of two types:

1. Active reabsorption
2. Passive reabsorption

Active reabsorption is the movement of molecules against the electrochemical (up hill) gradient. It needs liberation of energy which is derived from ATP.

Substances reabsorbed actively

The substances reabsorbed actively from the renal tubule are sodium, calcium, potassium, phosphates, sulfates, bicarbonates, glucose, amino acids, ascorbic acid, uric acid and ketone bodies.

In this, the molecules move along the electrochemical (down hill) gradient. This process does not need energy.

Substances reabsorbed passively

The substances reabsorbed by passive transport are chloride, urea and water.

ROUTES OF REABSORPTION

There are two routes for the substances to be reabsorbed from tubular lumen into the peritubular capillary called trancelluar and paracellular routes.

Transcellular Route

It includes:

1. Transport from tubular lumen into tubular cell through apical (luminal) surface of the cell membrane.
2. Transport from tubular cell into interstitial fluid
3. Transport from interstitial fluid into capillary.

Paracelluar Route

It includes:

1. Transport from tubular lumen into interstitial fluid present inlateral intercellular space through the tight junction between the cells.
2. Transport from interstitial fluid into capillary.

SITE OF REABSORPTION

The reabsorption of the substances occurs in almost all the segments of tubular portion of nephron.

1. *Substances Reabsorbed from Proximal Convoluted Tubule*

Glucose, amino acids, sodium, potassium, calcium, bicarbonates, chlorides, phosphates, uric acid and water are reabsorbed from proximal convoluted tubule.

2. *Substances Reabsorbed from Loop of Henle*

The substances reabsorbed from loop of Henle are sodium and chloride.

3. *Substances Reabsorbed from Distal Convoluted Tubule*

Sodium, bicarbonate and water are reabsorbed from distal convoluted tubule.

TUBULAR SECRETION

Some substances are also secreted into the lumen from the peritubular capillaries through the tubular epithelial cells. It is known as tubular secretion or tubular excretion.

SUBSTANCES SECRETED IN DIFFERENT SEGMENTS OF RENAL TUBULES

1. Potassium is secreted actively by sodium-potassium pump in proximal and distal convoluted tubules and collecting ducts.
2. Ammonia is secreted in the proximal convoluted tubule.
3. Hydrogen ions are secreted in the proximal and distal convoluted tubules. Maximum hydrogen ion secretion occurs in proximal tubule.

Thus, urine is formed in the nephron by the processes of glomerular filtration, selective reabsorption and tubular secretion.

RENAL CALCULI

Renal and Vesical calculi

Approximately 2% of the populations in the UK have a urinary tract stone at any given time a much higher prevalence of stone disease has been recorded elsewhere, notably in the Middle East. In the West, most stones occur in the upper urinary tract. The incidence of bladder stones has declined in the UK since the eighteenth and nineteenth centuries, whereas in some developing countries they are still common.

Most stones are composed of calcium oxalate and phosphate; these are more common in men mixed infective stones, which account for about 15% of all calculi, are twice as common in women as in men. The overall male: female ratio of stone disease is 2:1.

Stone disease is frequently a recurrent problem. More than 50% of patients with a calculus will have formed a further stone or stones within 10 years. The risk of recurrence increases if a metabolic or other abnormality predisposing to stone formation is present and is not modified by treatment.

Type and frequency of renal stones in the UK

Type of renal stone	**Approximate frequency (%)**
Calcium oxalate usually with calcium phosphate	65
Calcium phosphate alone	15
Magnesium ammonium phosophate (struvite)	10-15
Uric acid	3-5
Cystine	1-2

KIDNEY STONES: PREDISPOSING FACORS:

Environmental and dietary	
• Low urine volumes: high ambient temperatures, low fluid intake • Diet: high protein intake, high sodium, low calcium • High sodium excretion	• High oxalate excretion • High urate excretion • Low citrate excretion
Other medical conditions	
• Hypercalcaemia of any cause • Ileal disease or resection (leads to increased oxalate absorption and urinary excretion)	• Renal tubular acidosis type (distal) (e.g. in Sjögren's syndrome)
Congential and inherited conditions	
• Familial hypercalciuria • Medullary sponge kidney • Cystinuria	• Renal tubular acidosis type ((distal) • Primary hyperoxaluria

TYPES OF STONES

Calcium salts, uric acid, cystine, and struvite, and struvite, (Mg NH_4PO_4) are the basic constituents of most kidney stones in the western hemisphere. Calcium oxalate and calcium phosphate stones make up 75 to 85% of the total *Calcium stones*.*Uric acid stones, Cystine stones Struvite stones are more common in men.* The average of onset is the third to fourth decade. Approximate 50% of people who form a single calcium stone eventually torn another's with in the next x10 years. The average rate of few stone formation in recurrent stone formers is about one stone every 2 or 3 years. Calcium stone disease is frequently familial.

1. **Calcium oxalate stones**

   Calcium oxalate stones are the most common type of kidney stone. Kidney stones are solid masses that form in the kidney when there are high levels of calcium, oxalate, cystine, or phosphate and too little liquid .Calcium oxalate stones are caused by too much oxalate in the urine.

Oxalate is a natural substance found in many foods. Your body uses food for energy. After your body uses what it needs, waste products travel through the bloodstream to the kidneys and are removed through urine. Urine has various wastes in it. If there is too much waste in too little liquid, crystals can begin to form. These crystals may stick together and form a solid mass (a kidney stone). Oxalate is one type of substance that can form crystals in the urine. This can happen if there is too much oxalate, too little liquid, and the oxalate "sticks" to calcium while urine is being made by the kidneys.

Calcium oxalate stone

Calcium phosphate stone

Rrisk factors

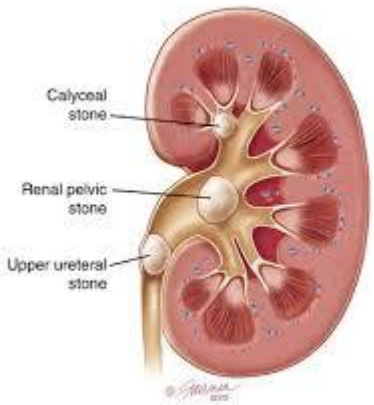
Dehydration from not drinking enough fluid

- A diet too high in:
  - Protein
  - Oxalate
  - Sodium (salt)
  - Sugar (like high fructose corn syrup)

- Obesity
- Medical conditions like:
    - Dent Disease (a rare genetic disorder that affects the kidneys)
    - Hyperparathyroidism (a very high amount of a type of hormone called parathyroid hormone in the blood that causes a loss of calcium. Calcium is needed to bind with oxalate and leave the body)
- Digestive Diseases and Surgeries like:
    - Inflammatory Bowel Disease (IBD) such as:
    - Ulcerative Colitis
    - Crohn's Disease
    - Gastric bypass surgeries

It is important to know that kidney stones are more common if you have Inflammatory Bowel Disease (IBD). These conditions affect your body's ability to absorb fats properly. When fat is not absorbed the right way, the fat binds to calcium and leaves oxalate behind. The oxalate is then absorbed and taken to the kidney, where it can form stones. Similarly, following gastric bypass surgery, your body absorbs less calcium from your digestive system. Because of this, higher levels of oxalate are found in the urinary tract. The build-up of oxalate can form crystals, which can form kidney stones.

If your calcium oxalate stones keep coming back, your healthcare provider may test you for these conditions. Your healthcare provider may also look at your lifestyle to help lower your risk factors or help find the cause of your forming calcium oxalate stones.



2. Uric acid stones:

Uric acid stones are radiolucent and are also more common in man. Half of patients with uric acid stones have gout, uric and lithiasis is usually familial whether or not gout is present.

3. Cystine stones:

Cystine stones are uncommon. Their radiopaity is due to the sulfur content. Cystine crystals appear in the urine as flat hexagonal plates

 .

4. Struvite stones:

Struvite stones are common and potentially dangerous. These stones occur mainly in women or patients who require chromic bladder catheterization and result from urinary treat infection with crease - producing bacteria usually protem species. The stones can grow to a large size and fill the renal pelvis and calycer to produce a ‘staghorn’ appearance. They are radio pague. In urine strutivte crystals are rectangular prisms.

TABLE 3 Major causes of Renal Stones					
Stone type and causes	**Percent of all stones[o]**	**Percent occurrence of specific causes[0]**	**Ratio of males to females**	**Etiology**	**Diagnosis**
Calcium stones Idiopathic Hyperuricosuria Hyperuricosuria Primary Hyperparathyroidism	75-85	50-55 20 5	2:1 to 3:1 2:1 4:1 3:10	Hereditary (?) Diet Neoplasia	Normocalcemia, unexplained hypercalciuria[b] Urine uric and > 750 mg per 24h (women), > 800 mg per 24 h (men) Unexplained hypercalcemia
Distal renal tubular acidosis Dietary hyperoxaluria		Rare 10-30	1:1 1:1	Hereditary High oxalate diet of low calcium diet	Hyperchloremic acidosis, minimum urine pH > 5.5 Urine oxlate >75 mg per 24 h
Enteric hyperoxaluria		~1-2	1:1	Bowel surgery	Urine oxlate >75 mg per 24h
Hereditary Hyperoxaluria		Rare	1:1	Hereditary	Urine oxlate and glycolic or 1-glyceric acid increased

Hypocitraturia		15-60	2:1 to 5:1	Hereditary (?), diet	Urine citrate <320 mg per 24 h
Idiopathic stone disease		20	2:1	Unknown	None of the above present
Uric acid stones	5-8				
Gout		~50	3:1 to 4:1	Hereditary	Clinical diagnosis
Idiopathic		~50	1:1	Hereditary (?)	Uric acid stones, no gout
Dehydration		?	1:1	Intestinal, habit	History, intestinal fluid loss
Lesch-Nyhan syndrome		Rare	Males only	Hereditary	Reduced hypoxanthine-guanine phosphoribosyltransferase level
Malignant tumors Cystine stones	1	Rare	1:1 1:1	Neoplasia Hereditary	Clinical diagnosis Stone type; elevated cystine excretion
Struvite stones	10-15		2:10	Infection	Stone type

STAG HORN CALCULI

Aetiology of bladder stones

Bladder stones are endemic in some developing countries. The cause of this is unknown but dietary factors are probably important. Stones forming in the bladder do so as a result of:

- Bladder outflow obstruction (e.g. urethral stricture, neuropathic bladder, prostatic obstruction)
- The presence of a foreign body (e.g. catheters, non-absorbable sutures).
- Significant bacteriuria is usually found in patients with bladder stones. Some stones found in the bladder have been passed down from the upper urinary tract.

INFECTION

Although urinary tract infection is not a direct consequence of stone disease, it can occur after instrumentation and surgery of the urinary tract, which are frequent in the treatment of stone disease. Stone disease and urinary tract infection can enhance their respective seriousness and interfere with treatment. Obstruction of an infected kidney by a stone may lead to sepsis and extensive damage of renal tissue, since it converts the urinary tract proximal to the obstruction into a closed, or partially closed, space that can become an abscess. Stones may harbor bacteria in the stone matrix, leading to recurrent urinary tract infection. On the other hand, infection due to bacteria that possess the enzyme urease can cause stones composed of struvite.

PATHOGENESIS OF STONES

Urinary stones usually arise because of the breakdown of a delicate balance. The kidneys must conserve water, but they must excrete materials that have a low solubility. These two opposing requirements must be balanced during adaptation to diet, climate, and activity. The problem is mitigated to some extent by the fact that urine contains substances that inhibit crystallization of calcium salts and others that bind calcium in soluble complexes. These protective mechanisms are less than perfect. When the urine becomes supersaturated with insoluble materials, because excretion rates are excessive and/or because water conservation is extreme, crystals form and may grow and aggregate to form stone.

SUPERSATURATION

In a solution in equilibrium with crystals of calcium oxalate, the product of the chemical activities of the calcium and oxalate ions in the solution is termed the *equilibrium solubility product*. If crystals are removed, and if either calcium or oxalate

ions are added to the solution, the activity product increases, but no new crystals form. Such a solution is *metastably supersaturated*. If new calcium oxalate seed crystals are now added, they will grow in size. Ultimately, as calcium or oxalate are added to the solution, the activity product reaches a critical value at which a solid phase begins to develop spontaneously. This value is called the *upper limit of metastability*. Stone growth in the urinary tract requires a urine that, on average, is above the equilibrium solubility product. Excessive supersaturation is common in stone formation.

Calcium, oxalate, and phosphate form many stable soluble complexes among themselves and with other substances in urine, such as citrate. As a result, their free ion activities are below their chemical concentrations and can be measured only by indirect techniques. Reduction in ligands such as citrate can increase ion activity, and therefore supersaturation, without changing total urinary calcium. Urine sueprsatuation can be increased by dehydration or by overexcretion of calcium, oxalate, phosphate, cystine, or uric acid. Urine pH is also important; phosphate and uric acid are weak acids that dissociate readily over the physiologic range of urine pH. Alkaline urine contains more dibasic phosphate, favouring depostis of brushite and apatite. Below a urine pH of 5.5, uric acid crystals (pK 5.47) predominate, whereas phosphate crystals are rare. The solubility of calcium oxalate, on the other hand, is not influenced by changes in urine pH. Measurements of supersaturation in a pooled 24-h urine sample probably underestimate the risk of precipitation. Transient dehydration, variation of urine.pH, and postprandial bursts of overexcretion may cause values considerably above average.

NUCLEATION

In urine that is supersaturated with respect to calcium oxalate, these two ions form clusters. Most small clusters eventually disperse because the internal forces that hold them together are too weak to overcome the random tendency of ions to move away. Large ion clusters can remain stable because attractive forces balance surface losses. Once they are stable, nuclei can grow at levels of supersaturation below that needed for their creation. Cell debris, calcifications on the renal papillae, and other urinary crystals can serve as templates for crystal formation, a process known as *heterogeneous nucleation*. Heterogeneous nucleation lowers the level of supersaturation required for crystal formation and is likely the mechanism by which wtones form in human urine.

INHIBITORS OF CRYSTAL FORMATION

Stable nuclei must grow and aggregate to produce a stone of clinical significance. Urine contains potent inhibitors of nucleation, growth, and aggregation for calcium

oxalate and calcium phosphate but not for uric acid, cystine, or struvite. In-organic pyrophosphate is a potent inhibitor that appears to affect calcium phosphate more than calcium oxalate crystals. Citrate inhibits crystal growth and nucleation, though most of the stone inhibitory activity of citrate is due to lowering urine supersaturation via complexation of calcium. Other urine components such as glycoproteins inhibit all three processes of calcium oxalate stone formation. As a consequence of the presence of these inhibitors, crystal growth in urine is slow compared with growth in simple salt solutions, and the upper limit of metastability is higher.

EVALUATION

CALCIUM STONES

Idiopathic hypercalciuria. This condition appears to be hereditary, and its diagnosis is straight forward. In some patients, parimary intestinal hyperabsorption of calcium causes transient postprandial hypercalcemia that suppresses secretion of parathyroid hormone. The renal tubules are deprived of the normal stimulus to reabsorb calcium at the same time that the filtered load of calcium is increased. In other patients, reabsorption of calcium by the renal rubules appears to be defective, and secondary hyperparathyroidism is evoked by urinary losses of calcium.

Renal synthesis of 1,25-dihydroxyvitamin D is increased, enhancing intestinal absorption of calcium. In the past, the separation of “absorptive” and “renal” forms of hypercalciuria was used to guide treatment. However, these may not be distinct entities but the extremes of a contrinum of behavior. Vitamin D overactivity, either through high calcitriol levels or excess vitamin D receptor, is a likely explanation for the hypercalciuria in many of these patients. Hypercalciuria contributes to stone formation by raising urine saturation with respect to calcium oxlate and calcium phosphate.

TREATMENT

For many years the standard therapy for hypercalciuria was dietary calcium restriction,. However, recent studies have sohwn that low-calcium diets increase the risk of incident stone formation. In addition, hypercalciuric stone formers have reduced bone mineral density and an increased risk of fracture compared to the non-stone-forming population. Low calcium intake likely contributes to the low bone mineral density. A recent prospective trial compared the efficacy of a low-calcium diet to a low-protein, low-sodium, and normal-calcium diet in preventing stone recurrence in male calcium stone formers. The group on the low-calcium diet had a significantly greater rate of stone relapse. As a whole, low-calcium diets do not appear to be efficacious and carry a long-

term risk of bone disease in the stone-forming population. Low-sodium and low-protein diets are a superior option in stone formers.

Hyperuricosuria

About 20% of calcium oxalate stone formers are hyperuricosurics, primarily because of an excessive intake of purine from meat, fish, and poultry. The mechanism of stone formation is probably due to salting out calcium oxalate by urate. A low-purine diet is desirable but difficult for many patients to achieve.

Primary Hyperparathyrodism.

The diagnosis of this condition is established by documenting that hypercalcemia that cannot be otherwise explained is accompanied by inappropriately elevated serum concentrations of parathyroid hormone. Hypercalciuria, usually present, raises the urine supersaturation of calcium phosphate and / or calcium oxalate.

Distal Renal Acidosis

The defect in this condition seems to reside in the distal hephron, which cannot establish a normal pH gradient between urine and blood, leading to hyperchloremic acidosis. The diagnosis is suggested by a minimum urine pH above 5.5 in the presence of systemic acidosis. If the diagnosis is in doubt because metabolic abnormalities are mild, oral challenge with NH_4Cl, 1.9 mmol/kg of body weight, will not lower urine pH below 5.5 in patients with distal RTA. Hypercalciuria, an alkaline urine, and a low urine citrate level cause supersaturation with respect to calcium phosphate. Calcium phosphate stones form, nephrocalcinosis is common, and osteomalcia or rickets may occur. Renal damage is frequent, and glomerular filtration rate falls gradually.

Hypocitraturia

Urine citrate prevents calcium stone formation by creating a soluble complex with calcium, effectively reducing free urine calcium. Hypocitraturia is found in 15 to 60% of stone formers, either as a single disorder or in combination with other metabolic abnormalities. It can be secondary to systemic disorders, such as RTA, chronic diarrheal illness, or hypokalemia, or it may be a primary disorder, in which case it is called *idiopathic hypocitraturia*.

Idopathic Calcium Lithiasis

Some patients have no metabolic cause for stones despite a through metabolic evaluation. The best treatment appears to be high fluid intake so that the urine specific gravity remains at 1.005 or below throughout the day and night.

Investigations

IVU is very accurate and remains the most commonly used investigation world-wide, but spiral CT gives the most accurate assessment and will identify non-opaque stones (e.g. uric acid).

Patients with a first renal stone should have a minimum set of investigations; the yield of more detailed investigation is low, and hence usually reserved for those with recurrent or multiple stones, or those with complicated or unexpected presentations e.g. in the very young.

LABORATORY INVESTIGATIONS:

Microscopic examination of the urine, which may show

- Red blood cells
- Bacteria
- Leukocytes
- Urinary casts and crystals.

Urine Culture to identify any infecting organisms present in the urinary tract and Sensitivity to determine the susceptibility of these organisms to specific antibiotics.

Complete Blood Count (CBC), looking for neutrophilia(increased neutrophil granulocyte count) suggestive of bacterial infection, as seen in the setting of struvite stones.

Renal Function tests to look for abnormally high blood calcium blood levels (hypercalcemia).

24 hour Urine Collection to measure total daily urinary volume, magnesium, sodium, uric acid, calcium, citrate, oxalate and phosphate.

Collection of stones is useful. Chemical analysis of collected stones can establish their composition, which in turn can help future preventive and therapeutic management.

IMAGING TECHNIQUES:

Various imaging techniques are helpful in determining the presence of kidney stones. The best approach uses spiral (or helical) computed tomography scans.

- If these scans are not available, the patient will need ○ ultrasound or
- standard X-rays.

- If no stones show up, but the patient has severe pain that suggests thepresence of kidney stones, the next step is an intravenous pyelogram.

X-RAY:

A standard x-ray of the kidneys, ureters, and bladder may be a good first step for identifying stones, since many are visible on x-rays. Calcium stones can be identified on x-rays by their white color. Cystine crystals can also show up on x-rays.

EXCRETION UROGRAPHY:

It is the most useful investigation to establish thepresence of calculus. It also shows where the stone is and gives important information about the function of the other kidney.

ULTRASOUND:

Ultrasound can detect clear uric acid stones and obstruction in the urinary tract. It is not useful for finding very small stones.

INTRAVENOUS PYELOGRAM:

In the procedure Intravenous pyelogram (IVP), the patient is injected with dye. X rays are taken as the dye travels through the urinary tract. This procedure is done to confirm the presence of kidney stones, although some stones may be too small to see.

RETROGRADE PYLOGRAM

It is a urologic procedure where the physician injects contrast into the ureter in order to visualize the ureter and kidney. The flow of contrast is opposite the usual flow of urine, hence the retrograde name.

SPIRAL (OR HELICAL) COMPUTED TOMOGRAPHY:

A type of computed tomography (CT) scan called a spiral or helical CT scan is currently the best method for diagnosing stones in either the kidneys or the ureters. This test is fast, does not require instruments or foreign chemicals to enter the body, and provides detailed accurate images of even very small stones. If stones are not present, a spiral CT scan can often identify other causes of pain in the kidney area. It is better than x-rays, ultrasound, and intravenous pyelogram -- the previous standard test for detecting kidney stone

PROTOCOL

Title:

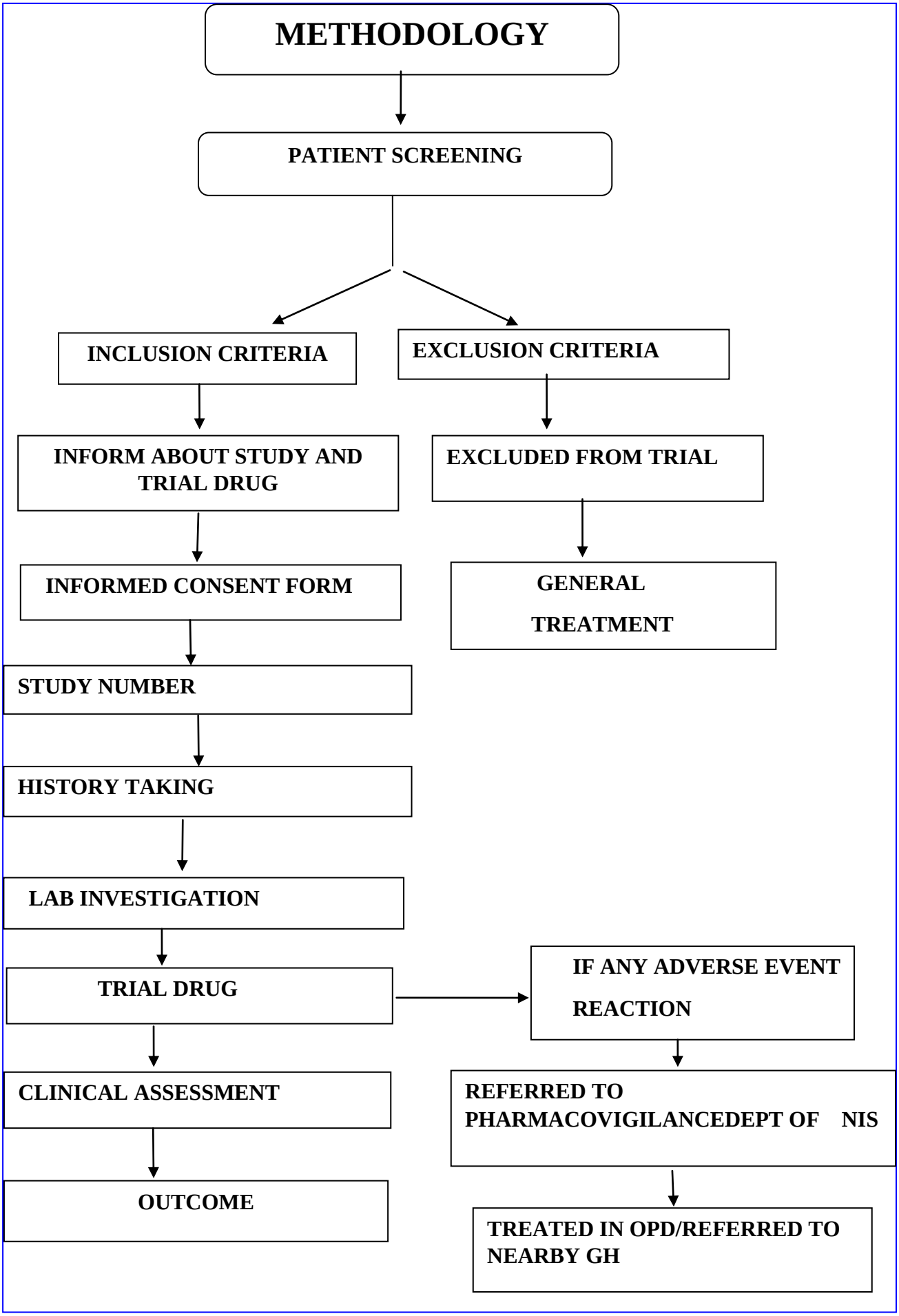
Clinical evaluation of siddha formulation **"SAARA PARPAM**" (internal) in the treatment of **AZHAL KALLADAIPPU NOI.**

Study design and conduct of study:

Study type	:	Open clinical trial
Study place	:	Out patient department of Ayothidoss Pandithar Hospital, National Institute of siddha, Tambaram sanatorium, Chennai-47.
Study period	:	12 months.
Sample size	:	40 patients both male and female

Treatment:

Drug	:	SAARA PARPAM
Dosage	:	2 Kuntri (260mg) (twice/day) after food
Adjuvant	:	Seeraga kudineer (30ml)
Route of administration	:	Oral route
Duration of the drug administration	:	48 days
Indication	:	Kalladaippu
Book Ref	:	Pathartha guna vilakkam
Editor name	:	C.Kannusami pillai
Edition	:	4^{th} edition


METHODOLOGY
PATIENT SCREENING
INCLUSION CRITERIA
EXCLUSION CRITERIA
INFORM ABOUT STUDY AND TRIAL DRUG
EXCLUDED FROM TRIAL
INFORMED CONSENT FORM
GENERAL TREATMENT
STUDY NUMBER
HISTORY TAKING
LAB INVESTIGATION
TRIAL DRUG
IF ANY ADVERSE EVENT REACTION
CLINICAL ASSESSMENT
REFERRED TO PHARMACOVIGILANCEDEPT OF NIS
OUTCOME
TREATED IN OPD/REFERRED TO NEARBY GH

Subject selection:

As and when patients reporting at out patient department 1 Maruthuvam, Ayothidoss Pandithar Hospital, National Institute of Sddha with symptoms of inclusion criteria will be subjected to screening test and documentation will be done by using screening proforma.

Selection criteria:

Inclusion criteria:

Patients who will being fulfill any of the following criteria will be included in the study

- Age:20-60 years
- Sex: Both Male, Female
- Patients who are having the classical symptoms of abdominal pain, distension, pain from loin to groin, pain in urethra, agonizing pain, dysuria, oliguria, yellow coloured urination, burning micturition, haematuria, nausea, vomiting.
- Patient with renal calculus detected on USG Abdomen**,** Stone size:10mm<4mm Patient willing to sign the informed consent stating that he/she will conscientiously stick to the treatment during 48 days but can opt out of the trial of his/her own conscious discretion.
- Patient who are willing to take Ultrasonography investigation (USG- Abdomen/ KUB) and provide blood sample for lab investigation.

Exclusion criteria:

A patient who will meet any of the following criteria will be excluded from participation in this study:

- Stone size > 10mm
- Pregnancy & Lactation
- Presence of any associated severe systemic illness eg.CA
- Diabetes mellitus
- Hypertension
- Chronic kidney disease
- Cardiac disease

Withdrawal criteria:

- Intolerance to the drug and development of any serious adverse reactions during the trial period.
- Patient turned unwilling to continue in the course of clinical trial.
- Increase in severity of symptoms.
- Patient will not take medication regularly.

Assessments and investigations:

a. Clinical assessment

   Siddha assessment

   Routine investigations:

      1. Modern parameters
      2. Siddha parameters

b. Specific investigations

   USG

Clinical assessment

- Pain from loin to groin
- Pain in urethra,
- Dysuria,
- Oliguria
- Abdominal pain distension
- Yellow coloured urination
- Burning micturition,
- Haematuria
- Nausea
- Vomiting

Siddha assessment

Enn vagai thervu (Eight types of Examination):

- Naadi
- Sparisam
- Naa

- Niram
- Mozhi
- Vizhi
- Malam
- Moothiram

Siddha parameters:

- **Malam** - Niram:
  - Elakal / Erukal:
  - Muraigal (Times / day) :
- **Moothiram** (**urine**):

  Neerkkuri (urine signs): Neikkuri:

  i. Niram:
  ii. Edai:
  iii. Manam:
  iv. Nurai:
  v. Enjal

Routine investigations:

Modern parameters:

- **Haematology**
- **Blood sugar level** - Fasting (mg/dl)

  Post prandial (mg/dl)

  Random (mg/dl)
- **Lipid profile**
- **Renal function test** - Blood Urea (mg/dl)

  Serum total creatinine (mg/dl)

  Uric acid **(**mg/dl)
- **Liver function test**
- **Urine test**: Albumin

  Sugar(fasting and post prandial)

  Deposits

	Bile salts
	Bile pigments
	Urobilinogen
Motion test:	ova,
Cyst	
Occult blood	
Special investigations	USG Whole Abdomen/KUB

STUDY ENROLLMENT:

- In this clinical trial, patients reporting at out patient department, Ayothidoss Pandithar Hospital,National Institute of Siddha with the clinical symptoms of abdominal pain, distension, pain from loin to groin, pain in urethra, agonizing pain, dysuria, oliguria, yellow coloured urination, burning micturition, haematuria, and vomiting, nausea will be enrolled in the study based on the inclusion and exclusion criteria.
- The patients enrolled in this study will be informed (Form V) about the objective of the study, trial drug, possible outcomes in their own language and terms understandable to them.
- After ascertaining the patient's willingness, informed consent will be obtained in the consent form (Form VI).
- All these patients will be given unique registration card which will contains information regarding patients' Registration number, Address, Phone number and Doctors phonenumber etc. so as to report easily if any adverse reaction arises.
- Complete clinical history, complaints and duration, examination findings will be recorded in the prescribed Proforma in the Clinical research form.
- Patients will be advised to take the trial drug and appropriate dietary advice (FormVIII) would be given according to the patients' perfect understanding.

CONDUCT OF THE STUDY:

As per siddha literature, before starting the treatment for azhal kalladaippu, purgation will be given with the out patient department medicine Agasthiar Kuzhambu 130 mg od with 15ml of nei(ghee) at early morning in empty stomach for one day

Next day rest will be advised to the patients, 3rd day onwards the trial drug "Saara parpam" will be given given at a dose of 260mg twice a day after food continuously for 48 days. At each clinical visit clinical assessment will be done and prognosis will be noted.

Laboratory investigations and USG Abdomen will be done on 0th day and24th day of the trial. If any of the trial patient who fails to collect the trial drug on the prescribed day but wants to continue in the trial, from the next day or two ,he/ she will be allowed, but defaulters of one week and more will not be allowed to continue and be withdrawn from the study with fresh case being inducted.

Follow-up: After the end of the treatment, the patient is advised to visit the out patient department for another 2months for follow-up. In this follow-up period patient's clinical improvement will be recorded.

DATA MANAGEMENT:

- After enrolling the patient in the study, a separate file for each patient will be opened and all forms will be filed in the file. Study No. and Patient No. will be entered on the top of file for easy identification. Whenever the study patient visits out patient department during the study period, the respective patient`s file will be taken and necessary recordings will be made at the assessment form or other suitable forms.
- The screening forms will be filed separately.
- The Data recordings will be monitored for completion by Guide, Statical research officer (Statistics) and the adverse event will be monitored by the members of the Pharmacovigilance department of National Insitute of Siddha . All forms will be further scrutinized in presence of Investigator by Statical Research Officer (Statistics) for logical errors and incompleteness of data to avoid any bias. No modification in the results is permitted for unbiased reports.

OUT COME OF TREATMENT:

The study uutcome is mainly assessed by,

Primary out come

Clearance/reduction in the size of renal calculus in USG Abdomen

Secondary out come

Complete reduction of clinical symptoms and improvement in other lab investigations .

ADVERSE EFFECT/SERIOUS EFFECT MANAGEMENT:

If the trial patient develops any adverse reaction, he/she will be referred to the pharmacovigilance department of National Institute of Siddha. The members of this department will assess the adverse event and recorded in the prescribed adverse reaction form. For any adverse effect the Patient will be given the proper management at National Institute of Siddhac with free of cost.

STATISTICAL ANALYSIS:

All collected data will be entered into the computer and manually cross-checked the correctness of the data entry. The number and size of the calculi will be paired't' test and chi-square test which will be employed to study the efficacy of treatment.

ETHICAL ISSUES:

1. Informed consent will be obtained from the patient after explaining in the understandable language to the patient. The patient will be informed about the clinical trial, diagnosis, treatment and follow-up. After getting the consent of the patient (through consent form) they will be enrolled in the study.
2. Patients will be sent to National Accreditation Board for Testing and Calibration Laboratories **(NABL**) certified laboratory to take USG KUB and the charge will be borne by the investigator.
3. Treatment will be provided free of cost.
4. No other external medicines will be used. There will be no infringement on the rights of patient.
5. To prevent any infection, while collecting blood sample from the patient, only disposable syringes, disposable gloves, with proper sterilization of lab equipments will be used.
6. The data collected from the patient will be kept confidentially.
7. The patients who are excluded [as per the exclusion criteria] will be given proper treatment, in the out patient ward,National Institue of siddha .

8. All adverse events occurs during the trial period will be recorded by the members of Pharmacovigilance department, National Institute ofSiddha. If it is a mild event the patient will be treated at out patient department of NIS. If the adverse event is severe the patient will be referred to nearby Govt. hospital and taken care of the patient until he/she will recover from the symptoms.The treatment will be provided at free of cost.

ASSESSMENT FORMS:

Form - I	Screening and Selection Proforma
Form - II	Case record form
Form - III	Laboratory investigation form
Form – IV	Drug Compliance form
Form - V	Information sheet
Form - VI	Consent form
Form -VII	Withdrawal form/ Adverse drug reaction form/ Pharmacovigilance form
Form -VIII	Dietary advice forms

STANDARD OPERATING PROCEDURE FOR SAARA PARPAM

REQUIRED RAW DRUGS:

- **Vedi uppu(Potassium nitrate)**
- **Navasaaram(Ammonium sulphate)**
- **Adhathoda[*Justicia vasica Linn*]**

Source of raw drugs:

The above said raw drugs will be purchased from a well reputed country shop at Chennai .The herbal raw drugs will be authenticated by Botanist National Institute of Siddha and the mineral raw drugs will be authenticated by Siddha council research institute Arumbakkam,Chennai. The raw drugs will be purified and the medicine will be prepared as per SOP as in the Gunapadam Laboratory of National Institute of Siddha, Chennai.

Purification of ingredients of the trial drug:

Purification of Navacharam:

Take 70gm navacharam dissolve it in cow's urine, filter and boil ,till it condenses and dry it.

Purification of Vediuppu:

Take 70gm Vediuppu one part dissolve it in two parts of sea water ,filter and boil it in an iron vessel transfer it into a copper vessel and keep in cool place and dry. Repeat the above process for 5 to 7 times.

Purification of Adathodai:

Take adequate amount Adathodai leaves and wipe with dry clean cloth and remove the putrefied parts and mid vein.

Method of preparation:

Purified ingredients:

1. Purified Navasaram(Ammoniam sulphate)	-	2 Palam (70gm)
2. Purified Vediuppu(Potassium nitrate)	-	2 Palam (70gm)
3. Adathodai charu	-	Adequate amount

Method of preparation

Step-1

Purified Navasaram and Vediuppu are taken and ground well with Adathodai leaf juice for 12 hours (4 Samam) and made into a villai.

Step-2

The obtained tablets are placed in a mud container. A mud Container with a ring finger sized hole is placed appropriately in upside down position over the mud container containing villai and fixed by seelai.

Step-3

The container is heated in low flame. The hole above the mud container is covered by a round container and fixed by cowdung.

Step-4

When the smoke raises speedly over the hole the container placed above is taken slightly and closed to minimise speed of the smoke.

Step-5

After the above procedure the obtained medicine is ground well in a mortar and stored in a container.

Dose of drug	-	2 kuntri (260 mg) [twice/day] after food
Adjuvent	-	Seeraga kudineer
Duration	-	48 days
Indication	-	kalladaippu
Reference	-	Pathartha Kuna vilakkam kannusamy pillai, pg.no.140-141

Drug storage:

The prepared drug will be stored in a clean and dry wide mouthed glass bottle.

Dispensing:

The prepared drug will be dispensed in sachets(260mg each) once in 8days for 48days. At each visit the patients will be advised to return the unconsumed drug if any.

DRUG REVIEW

Navachaaram

1. **Chemical name**

   Ammonium chloride or ammoni chloridum.

2. **Other names**

   Istigai, Salligai, Sooli

3. **Vernacular names**

Sans	-	Navasara; Navasagara
Eng	-	Sal Ammoniac
Arab	-	Armina
Punj, Perr	-	Noshandar
Kash	-	Nausaden
Hind	-	Navasadara
Ben	-	Navasagara
Duk, Guj, Mah, Kon	-	Navasagar
Tam& Sintr	-	Navacharam, Navacharum
Burm	-	Lovas; Zarasa.
Mal & Tel	-	Navasaram

Colour:

White or grey colors

Taste

Bitter , Sour, Urine smell

4. **Character:**

Navachaaram is a clourless in odorous and translucent fibrous mass known as Salammoniac- Ammonii Chloridum, Murias Ammonia. It is a thick heavy substance, it so hard that it cannot be easily powdered and is of a bitter acrid taste. It is soluble in water and rectified spirit.

Synthetic Preparation of Ammonium Chloride:

The Sand available at the places where animals and human beings defecate is collected and placed in a pot. To one part of the sand four parts of the urine is added; the clear liquid obtained is taken out Camphor, alum and potassium nitrate (3500 gm each) are powdered and burnt and added to 1300 litre of the liquid. The mixture is poured is another pot and the pot is covered and subjected to sublimation. Ammonium Chloride settles as a sublimate.

5. **Actions:**

1. Tonic - in small doses given for a long period, improves the bodystrength.
2. Stimulant - If given in high doses.
3. Expectorant -
4. Diaphoretic - It acts on the lymphatic channel and glands.
5. Diuretic
6. Rubi facient
7. Pitha neutralizer

6. **GENERAL PROPERTIES**:

"குன்மம் குடற்சூலை கொல்லும் மகோதரத்தை
வன்மையுறு கல்லடைப்பை மாற்றுங்காண் - சன்மக்
கவிச்சுமுத் தோடங் கனவாத நீக்கம்
நவாச்சார மாதே நவில்"

Abdominal pain, distended abdomen, urinary calculus, bad odour in the skin, sinusitis, amenorrhoea, whooping cough, intermittent fever three humours, indigestion, hepatomegaly, hepatitis, splenomegaly, rhinitis, tuberculosis, haematemesis, facial paralysis.

7. Saththuru and Miththuru

நவாச்சாரத்தின் சத்துரு:

கல்லுப்பு	சுக்கான்
இந்துப்பு	காரீயம்
படிகம்	கடல் நுரை
வளையலுப்பு	அப்பிரகம்
இரும்பு	சவுடு
காந்தம்	கிளிஞ்சல்

நவாச்சாரத்தின் மித்துரு

தாளகம்	சிலை	கல்நார்	செம்பு
வெடியுப்பு	வீரம்	நிமிளை	
இலிங்கம்	வெங்காரம்	நாகம்	

8. Uses:

- It relieves hepatiac congestion and modifies hepatic secretions.
- Useful incases of hepatic abscess, chronic hepatic congestion, and is dropsy connected with the liver and ovarian diseases.
- In cirrhosis and in jaundice from catarrh of the bile ducts.
- For hepatitis sal - ammoniac 8-15 grains mixed with 105 grains of absinthium (Worm wood) rubbed well in a mortar with a little water and given in a single dose will give relief.
- It is valuable combined with liquid extract of glycyrrhiza or syrup of country liquorice and with a few grains of powdered cinnamon in case of whooping cough.
- In amenorrhea, dysmenorrhea, gleet, leucorrhoea, chronic dysentery and other similar chronic dischargers from lungs, stomach and other internal organs. ‘
- In hysteria, nervousness, jaundice and other liver complaints and gastric catarrh doses of 10-20 grains three times daily are beneficial.
- It is often prescribed as a stimulating expectorant in chronic bronchitis and in pneumonia in the stage of resolution.

- In various forms of neuralgia, in chronic liver disease, organic or functional in rheumatic affections of the face.
- Externally its solution combined with nitre is a nice cooling andstimulant.
- Mixed with sulphide of arsenic, it is used as an application to scorpion bites.
- Ammonium chloride is recommended for local application in cases of cataract.
- The salt dissolved in the decoction of Hygrophila auriculata may act as a diuretic and may be effective in the treatment of jaundice, liver enlargement, and splenomegaly.
- Ammonium chloride and potassium nitrate solution may be used for pain in the eye and excessive lacrimation.
- The salt dissolved in camphorated water and administered twice daily for the diseases like flatulency, pain and swelling in the uterus bilious vomiting and headache.

VEDIUPPU

1. **Chemical name**

   Pottasium nitrate

2. **Other names**:

   Pottiluppu, Inangan, Padairasan, Boomikoormai, Navachara Mithru

3. **Vernacular Names** -

San	-	Yovakshara, Saindhava
Hind, Ben Punj & Dut	-	Shora, Sora, Shorakhar
Eng	-	Saltpetre, Nitre, Nitrate of Potash: Purified Nitre.
Ariah	-	Abkar, Ubkir
Pers	-	Shoraba
Hid & Guj	-	Shora
Mah	-	Shora- mitha
Guj	-	Shorakhar
Tel	-	Patluppoo
Tamil	-	Pottil - uppu

Mal	-	Veti Uppu
Can	-	Patluppu, sen - dur lavana
Kan	-	Sindur lavana
Sinh	-	Potlunu
Malay	-	Sundawa.

4. சுவை - கைப்பு
   வீரியம் - வெப்பம்
   பிரிவு - கைப்பு
   செய்கை - சிறுநீர் பெருக்கி, குளிர்ச்சியுண்டாக்கி, வியர்வையுண்டாக்கி, வியர்வை பெருக்கி

5. **General properties:**

"மல்லாரு மட்டகுன்ம மாதருத ரக்கட்டி
கல்லா மதைப்பு நீர்கட்டருக - லெல்லாமே
கம்பி கம்பி யென்றுங் கருவுண்டா மங்கி நின்ற
கம்பி கம்பி யென்றுரைக்குங்கால்

"சூதக வாயுவோடு சோணிதத்தின் வாதமும் போம்
வாதவலி குன்மமிவை மாறுங்காண் - மீதாங்
கொடிய வயிறிழியுங் கோழைகப மேகும்
வெடியுப்பு தன்னை விளம்பு"

பஞ்சபூத உப்பில் தேயுவின் கூறாகிய கம்பி உப்பினால் எண்வித குனமம், கருப்பாசயக்கட்டி, மூத்திரக் கிரிச்சரம், நீர்ச்சுருக்கு, சூதிகாவாதமம், வாதசோணிதம், சமானிய வாத, பித்த கப குன்மங்கள், பெருவயிறு,ஈளை, கபதோடம், இவை ஒழியும். பேரிளம் பெண் பருவங்கடந்த மாதர்கட்கும், கர்ப்பம் உண்டாகும். இதனால் சுரம், வீக்கம் கீல்வாதம் இரத்த பித்தம், பிரமேகம், கண்ணோய், தொண்டை ரணம், சுவாச காசம் முதலியவனவும் நீங்கும்.

- It is a salt which is prepared after five process from fuller's earth - பூநீரில் காய்ச்சும் ஐந்தாம் காய்ச்சலுப்பு.
- It is a salt prepared from the human skull

- ❖ It consists of white crystalline masses possessing a saline taste, it exists in a natural state in many parts of India.
- ❖ Those sold in the bazaars are sometimes are not sufficiently pure for internal use and it may be readily cleansed by dissolving it is hot water straining and setting the solutions aside to crystallise needle shaped crystals will be formed and they are pure.
- ❖ Salt petre stimulates the skin and the kidney increases perspiration and flow of urine and so cooling the body. It is very useful in fevers in inflammatory affections, common cold, rheumatism, gout, bronchitis etc.

6. Other Uses:

- ❖ Pottasium nitrate in solution is a refrigerant efficient, diuretic and disphoretic. It acts on the vascular system and thus reduces the frequency of the pulse.
- ❖ It is useful also in the early stages of dropsy in cases of small pox measles influenza, catarrh, gonorrhoea, acute rheumatism, bleeding from the lungs, stomach, uterus or other internal organs attended by fever.
- ❖ A mixture of nitre 2 parts and leaf juice of the Radish 1 part is given in doses of 80 grains to relieve scalding and retention of urine also suppression or scantiness of urine.
- ❖ In obstinate cases of leucorrhoea a combination of nitre 10 grains and alum 5 grains is recommended to be taken thrice daily.
- ❖ It maybe advantageously given with infusion of Moringa root.

ADHATODAI –ஆடாதோடை

1. BOTANICAL NAMES : *Adhatoda zeylania*

2. FAMILY : Acanthaceae

3. OTHER NAMES **:** Vasai

4.VERNACULAR NAMES:

San - Sinhaparni, Vasaka, Arusak, Vansa

Eng - Malabhar nut

Hind - Adosa, Arusha

Ben - Adulsa, Bakash

Pers - Bansa

Duk - Adarsa

Tel - Addasaram, Adampuka

Tami - Adhatodai

Mat - Ataloetakam

Guj - Aduraspee

Punj - Bhekkar

5. HABITANT:

This plant grows in most parts of India especially in the lower Himalayan ranges.

6. PARTS USED

Leaves, roots, flowers and bark.

7. CHEMICAL CONSTITUENTS

Alkaloid vasicine is reported from all parts, 2-Hyropsy -4 gluosylozychalcone, vasicinine from flowers stem and root, arachidic, behenic, cerotic, lignoceric, linoleic and oleic acids from seeds. Ether alkaloids, vasicol, vasicinone,vasicinol, vasicinolone, adhatodine are the components reported from various parts.

Vasicine

- The chief alkaloid vasicine is reported in all parts of the plant highest being in inflorescence.
- The alkaloids vasicine and vasicinone are reported to have smooth muscle relaxant action.
- The alkaloid produces a slight full of blood pressure followed by rise to the original level.

8. Properties:

- White needle shaped crystals.
- Melting point 190^{o}-191^{o}
- Souble in alcohol.

9. சுவை - கைப்பு

தன்மை - வெப்பம்

பிரிவு -கார்ப்பு

10. ஆடாதோ டைகைக்கிரத்த பித்தமறுங் காச

மானந்த வாயுவுடன் மேலிளைப்பு மேகம்

சூடாகும் தாப சுரம், பித்தகப வாத

சுரரோகஞ் சந்நிபா தஞ்சூலை குட்டம்

ஓடாவோ வாந்திவிக்கல் மூல ரோகம்

ஒளிதோடம் உட்கனலும் ஓழியுந் தானே

வாடாது மனக்கிளர்ச்சி யாகுமிதன் பெருமை

வகுத்துரைத்தார் முன்னோர்கள் வாழ்ந்திடயா வருமே

11. Actions:

- Expectorant
- Diuretic
- Anti spasmodic
- Alternative

12. Pharmcological actvities:

*Anti spasmodic	* Antibacterial
*Hypotensive	* Antiviral
*Bronchodilator	* Hypoglycaemic
*Respiratory Stimulent	* Uterine stimulant
* Juvenile Hormone Mimicking	* Ahortifacient activities.

13. Other uses.

- ❖ The leave and the root of this plant are considered a very efficacious remedy for all sorts of coughs being administered along with ginger.
- ❖ The root is diuretic is useful in bronchitis asthma, bilious vomiting, sore eyes, fevers gonorrhea.
- ❖ The leaves are also used for rheumatism.
- ❖ The flowers and the fruit are bitter aromatic and antispasmodic.

- The flowers, leaves and root are supposed to possess antispasmodic properties.
- Dried leaves in powdered form are given in doses of 30 grains in malaerial fevers.
- Fresh flowers are bound over the eyes in ophthalmia.

சீரகம்

1. BOTANICAL NAME - *Cuminum cyminum L*

2. FAMILY - Apiaceae (Umbelliferce)

3.OTHER NAMES

Asai, Seeri, Upkumbapeesam, Narcherri, Thuththasambalam, Praththiviaka, Pitha nasini, Posanakudari, Meththiyam.

4. VERNACULR NAMES -

Sans	-	Ajali, Jeeraka, Ajmoda, Kunchika, Jira
Eng	-	Cumin seed, Caraway Seed
Hind & Ben	-	Safed Jeera, Zira, Shiajira, Jira
Tel	-	Jeelakara
Tamil	-	Shimai Shombu, Cheerakum, Jeerakam.
Arb	-	Kamum., Kammon
Guj	-	Safed Jiraun
Sind	-	Zero
Pers	-	Zeera, Zira
Guj	-	Safed Jiraun,
Sind	-	zero.
Mal	-	Cheerakan, Jeerakan
Can	-	Jeerigay
Arab	-	Kamun

5. HABITANT

A small slender annual herb, cultivated in almost all the states in India except Bengal and Assam.

6. PARTS USED

Fruit, Seed

7. CHEMICAL CONSTITUENTS:

(i) Lipids:

Cumin seeds contain upto 14.5 percent lipids. The lipids contain: Neutral lipids, glycolipids, and phospholipids, 84.8, 10.1 and 5.1% respectively.

(ii) Flavonoid Glycosides:

The seed are reported to contain fourteen flavonoid glycosides of which seven belong to apigenin five to luteolin and two to chrysoeriol groups.

(iii) Essential oil:

A valuable essential oil thymene rich in carvone obtained from the seeds.

8. சுவை - கார்ப்பு, இனிப்பு

தன்மை - தட்பம்

பிரிவு - இனிப்பு

9. குணம்:

வாந்தி யருசி குன்மம் வாய்நோய்பீ லிகமிரைப்
பேற்றிருமல் கல்லிடைப்பி லாஞ்சனமும் - சேர்ந்த கம்மல்
ஆனகு டாரியெனும் அந்த கிரகணியும்
போசனகு டாரியுண்ணப் போம்

10. Actions :

- Carminative
- Aromatic
- Stomachic
- Stimulant
- Astrigent

11. Pharmacological and biological studes

- Anti Tumour
- Hypoglycaemic
- Hypercholesterolaemic / Hypocholesterolaemic
- Hepatoprotective
- Cholinergic
- Antioxidant
- Gatactagogue
- Nutritional
- Anti Bacterial
- Anti fungal
- Anti viral
- Insecticidal

12. OTHER USES:

- Seeds are cooling in effect and used for gonorrhoeae, chronic diarrhoea, and dyspepsia.
- A quality of the seeds slightly smeared with ghee put into a pipe and smoked relieves hiccup.
- Cumin oil can be readily converted artificially into thymol; thymol is used as an anthelmintic against hookworm infestaions and also as an antiseptic.
- Cumin fruits are very useful in digestive disorders like biliousness, morning sickness, indigestion atomic dyspepsia, diarrhoea, flatulent colic.
- Cumin fruits are also very useful in constipation.

DRUG PHOTOS

NAVACHARAM

(Before purification)

(After purification)

VEDIUPPU

(Before purification)

(After purification)

ADATHODAI

SEERAKAM

SAARA PARPAM

OBSERVATION AND RESULTS

Distribution of cases by Gender

Table:1

Gender	No. of Cases	Percentage
Male	20	50
Female	20	50
Total	**40**	**100**

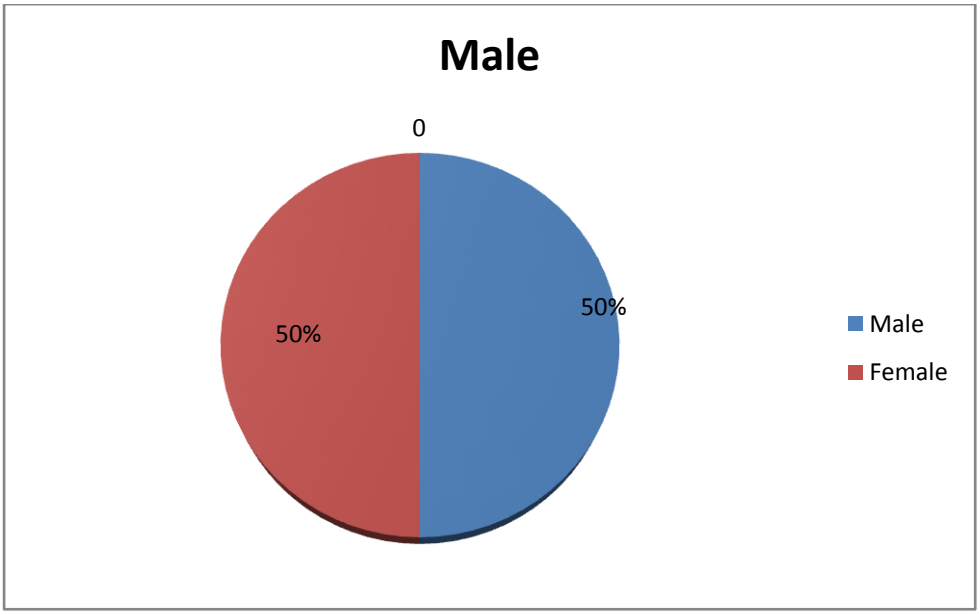


Fig-1

Inference:

Among 40 cases male and female were affected equal in number.

Distribution of Cases by Kaalam (According to Age)

Table: 2

Sl. No	Kaalam (Age)	No of Cases	Percentage
1	Vadha Kaalam (1-33 years)	20	50
2	Pitha Kaalam (34-66 years)	20	50
3	Kapa Kaalam (67-100 years)	**0**	**0**

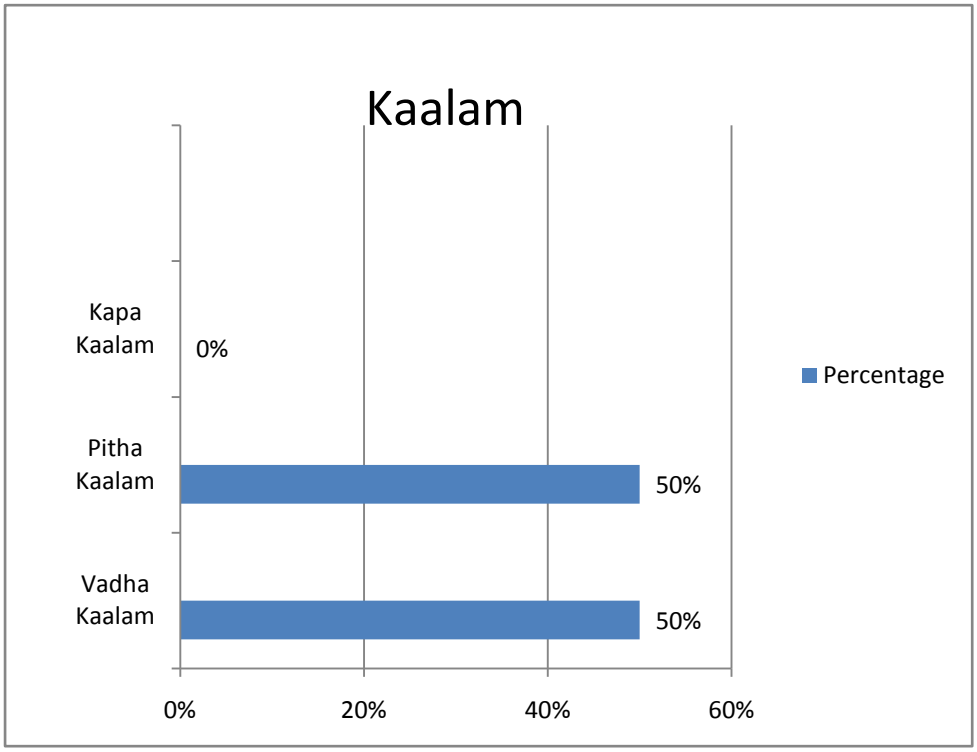


Fig:2

Inference:

Out of 40 cases, 20 cases (50%) were found to be in vatha kaalam i.e 1-33 years and 20cases (50%) were found to be in pitha kaalam i.e 34-66 years.

Distribution of Cases by Occupational Status

Table: 3

Sl. No	Nature of work	No of Cases	Percentage
1	Home maker	17	42.5
2	Field worker	6	15
3	Desk worker	13	32.5
4	Welding worker	4	10
	Total	**40**	**100**

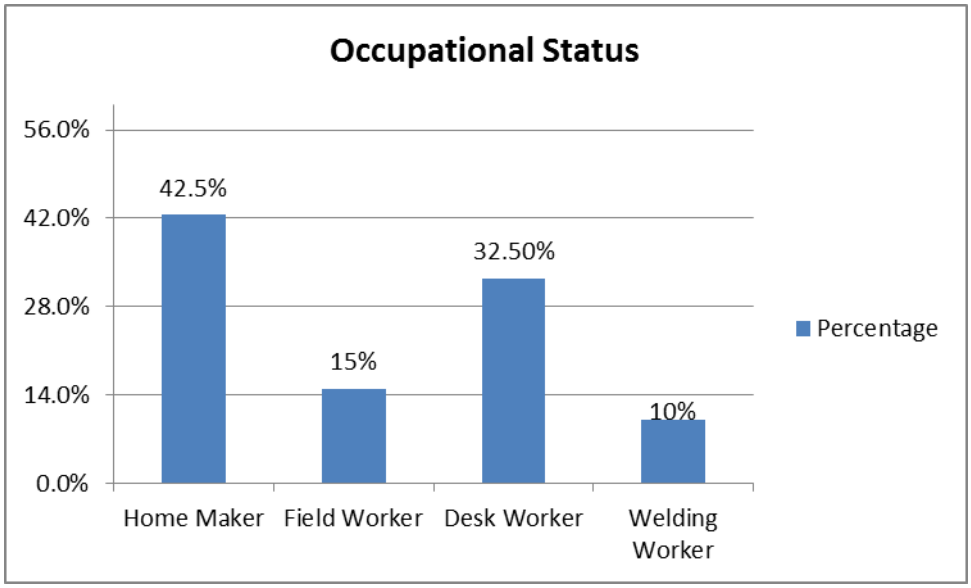


Fig-3

Inference:

The majority of patients in this study were home makers (42.5%)

Distribution of Cases by Dietary Habit

Table: 4

Sl. No	Dietary Habit	No of Cases	Percentage
1	Vegetarian	1	2.5
2	Non Vegetarian	39	97.5
	Total	**40**	**100**

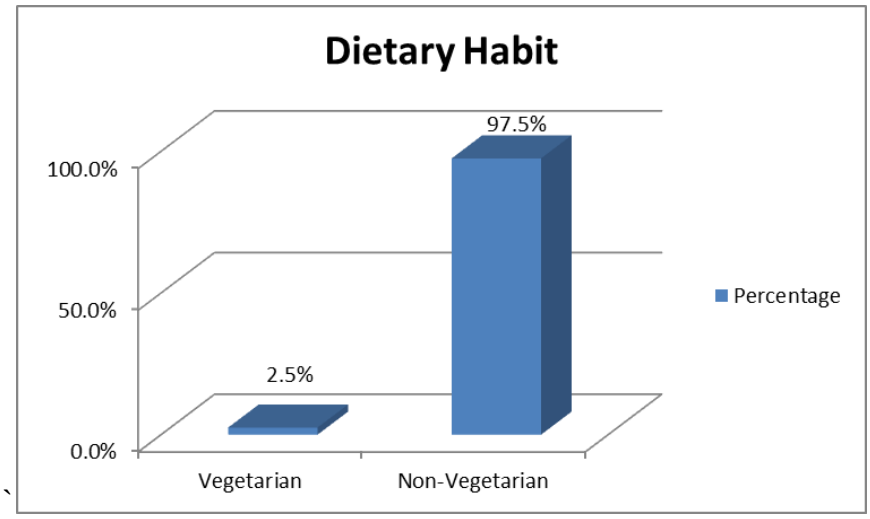


Fig-4

Inference:

Among 40 cases, 39 cases (97.5%) were non vegetarian and one case (2.5%) was vegetarian.

Distribution of cases based on the types of drinking water

Table: 5

Sl. No	Drinking Water	No of Cases	Percentage
1	Well Water	1	2.5
2	Corporation Water	2	5
3	Bore Water	2	5
4	Mineral Water	35	87.5
	Total	40	100

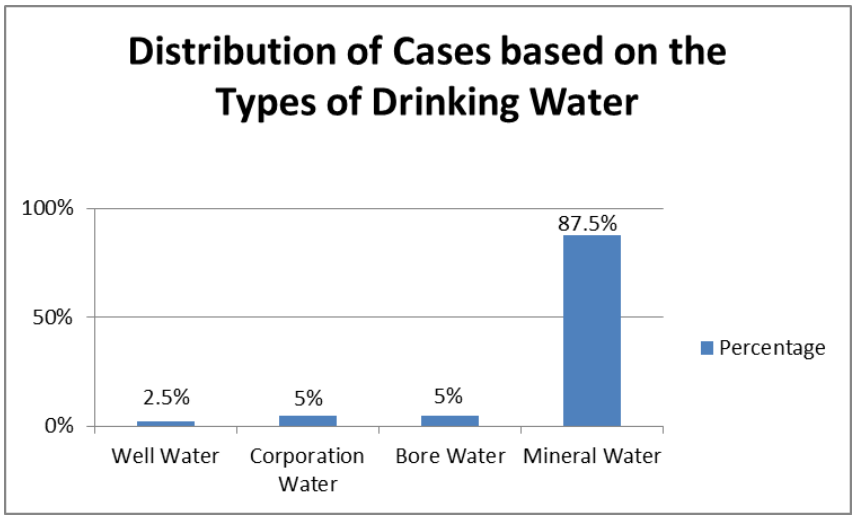


Fig-5

Inference:

Among 40 cases one case(2.5%) was a well water drinker.In corporation and bore water drinkers category each 2 cases were reported, 35 cases were reported under mineral water drinkers.

4. Distribution of Cases by Habits

Table: 6

Sl. No	Habits	No of Cases	Percentage
1	Alcohol Consumer	2	5
2	Smoker	1	2.5
3	Betal nut chewer	0	0

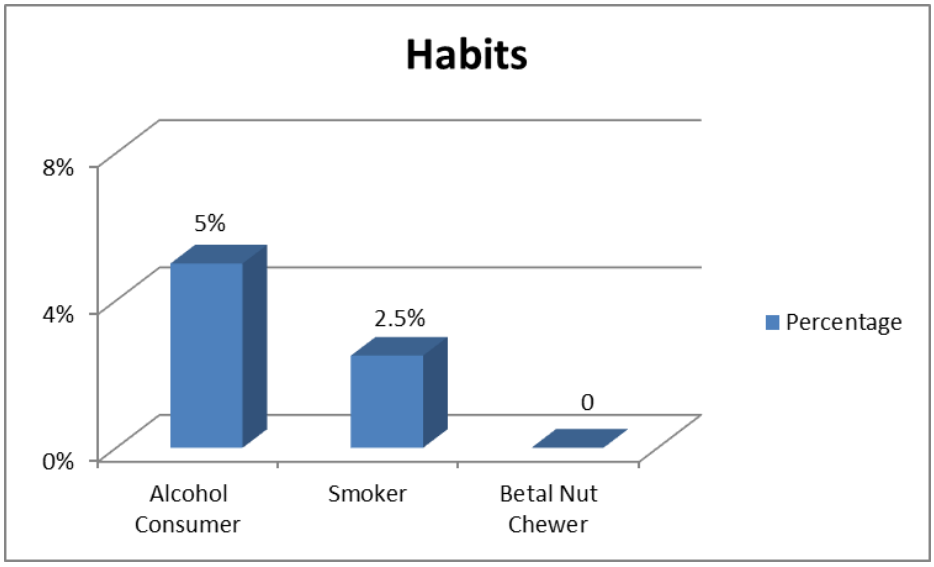


Fig-6

Inference:

Among 40 cases, 2 cases (5%) were alcohol consumers; one case (2.5%) was a smoker.

Distribution of Cases by Treatment history(Other than siddha medicine)

Table : 7

Treatment History	No of Cases	Percentage
Yes	2	5
No	38	95
Total	**40**	**100**

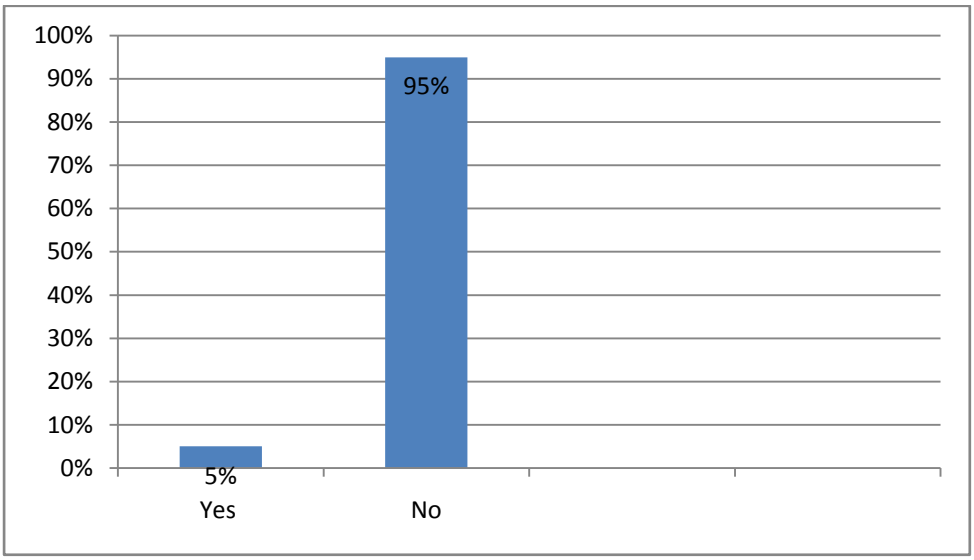


Fig-7

Inference:

Among 40 cases, 2 cases (5%) had taken allopathic treatment in the past and had discontinued the same. The rest of the 38 cases (95%) had not taken any other drugs prior to enrolling for the study.

Distribution of Cases by Family history

Table: 8

Family History	No of Cases	Percentage
Yes	6	15
No	34	85
Total	**40**	**100**

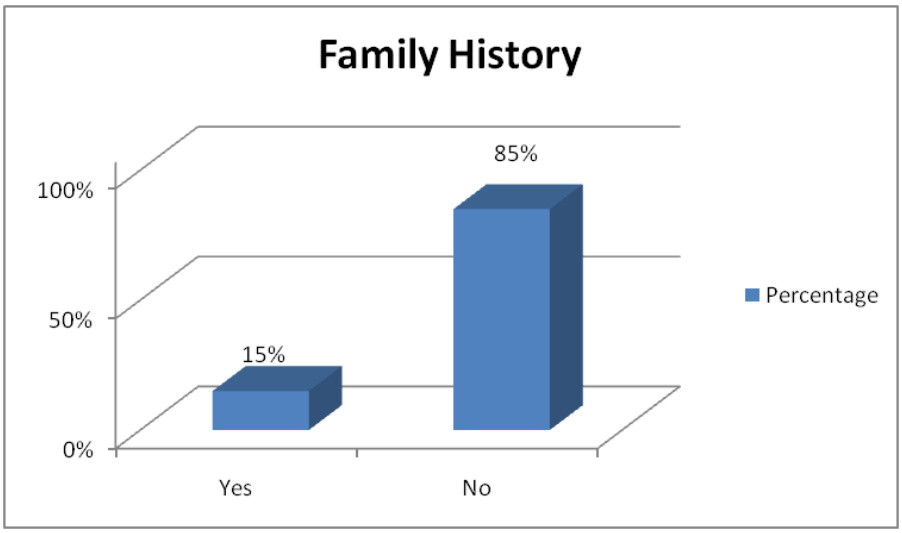


Fig-8

Inference:

Among 40 cases, 6 cases (15%) had positive family history.

Distribution of Cases by Paruva Kaalam (Season)

Table-9

Sl. No	Paruva Kaalam	No of Cases	Percentage
1	Kaar Kaalam (Aug 17-Oct 17)	0	0
2	Koothir Kaalam (Oct 17-Dec 16)	0	0
3	Manpani Kaalam (Dec 16-Feb 12)	20	50
4	Pinpani Kaalam (Feb 13-Apr 13)	20	50
5	Elavenil Kaalam (Apr 14-Jun 16)	0	0
6	Muthuvenil Kaalam (Jun 17-Aug 16)	0	0
	Total	**40**	**100**

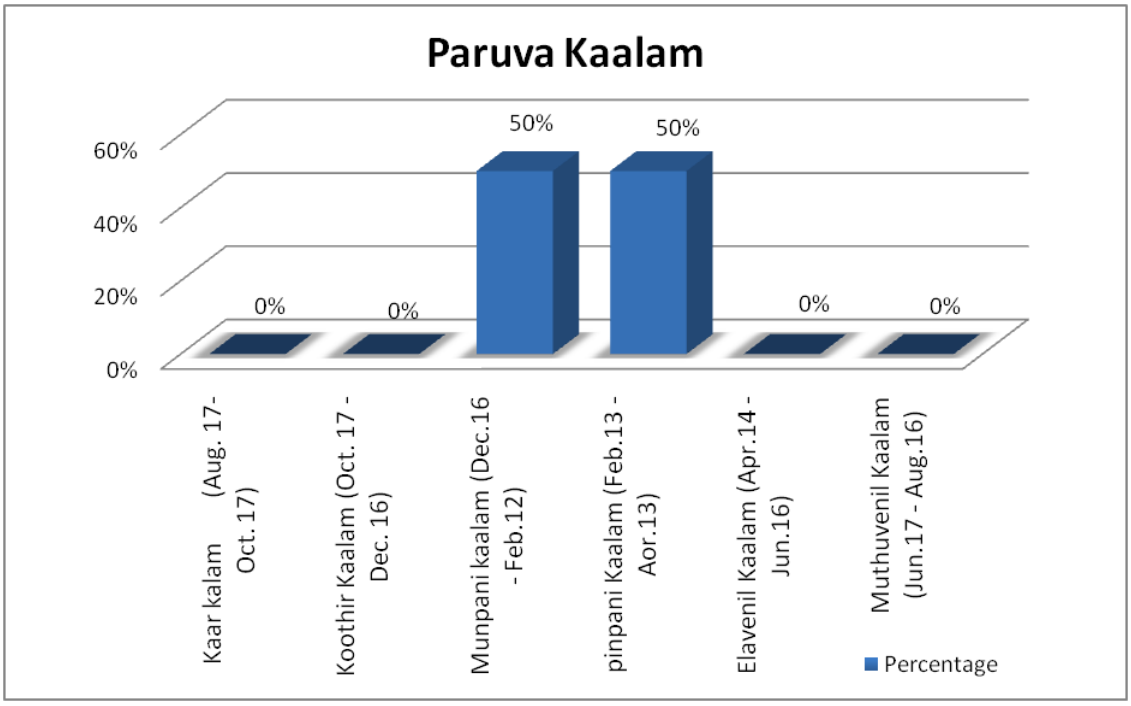


Fig-9

Inference:

Among 40 cases, 20 cases (50%) were admitted in Munpani kalam (Dec16-Feb12) and 20 cases (50%) were admitted in Pinpani kalam(Feb13-Apr13).

5. **Distribution of Cases by Thinai (Land)**

Table-10

Thinai (Land)	**No of Cases**	**Percentage**
Kurinji (Hill)	0	0
Mullai (Forest)	0	0
Marutham (Fertile)	13	32.5
Neithal (Coastal)	27	67.5
Paalai (Desert)	0	0
Total	**40**	**100**

Thinai

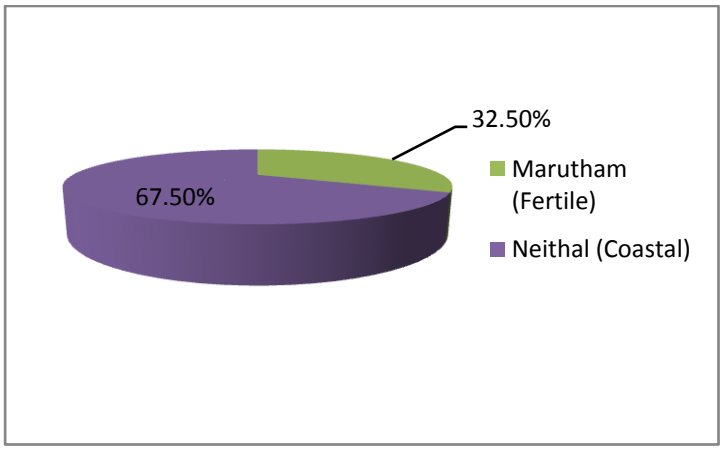


Fig-10

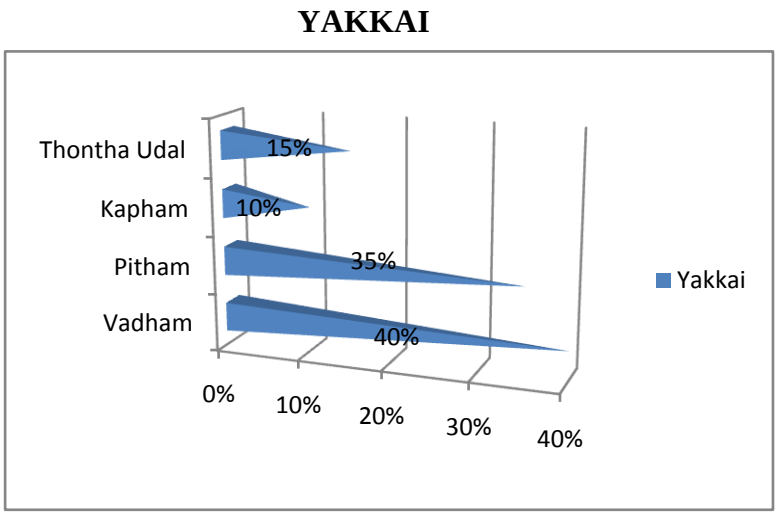
Inference:

Among 40 cases, 27 cases (67.5%) were from Neithal(coastal) thinai and 13 cases (32.5%) were from Marutham (fertile) thinai.

Distribution of Cases by Yakkai

Table-11

Yakkai	No of Cases	Percentage
Vadham	16	40
Pitham	14	35
Kapham	4	10
Thontham	6	15



Inference:

Among 40 cases 16 cases (40%) were Vatha thegi, 14 cases (35%) were Piththa thegi, 4cases (10%) were Kaphathegi and 6 cases (15%) were Tontha thegi.

Distribution of Cases by Gunam (Character)

Table-12

Gunam	No of Cases	Percentage
Saththuva gunam	1	2.5
Rajo gunam	34	85
Thamo gunam	5	12.5
Total	**40**	**100**

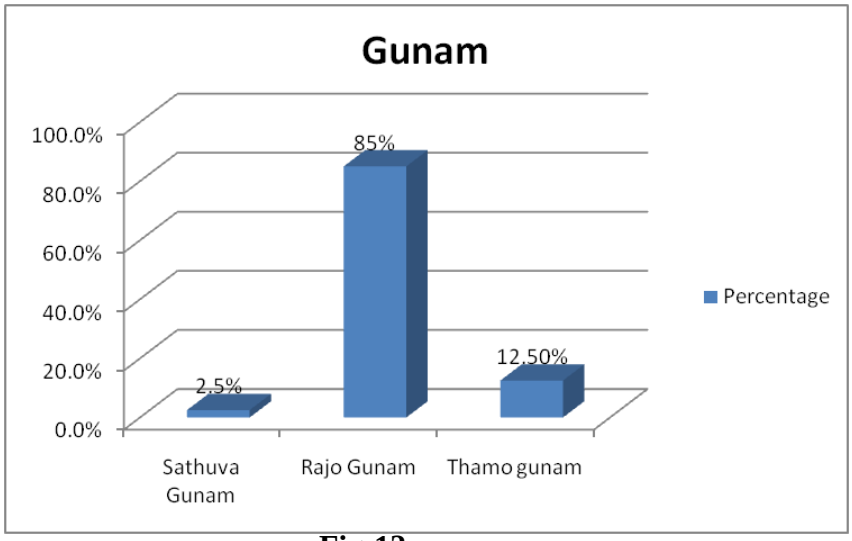


Fig-12

Inference:

Out of 40 cases, 34 cases (85%) were found to posses Rajo gunam, 5 cases (12.5%) were found to posses Thamo gunam and one case was (2.5%) found to posses Saththuva gunam.

Distribution of Cases by Envagai Thervugal

Table-13

Sl. No	En Vagai Thervugal	No of Cases	Percentage
1	Naa	11	27.5
2	Niram	5	12.5
3	Mozhi	0	0
4	Vizhi	12	30
5	Sparisam	8	20
6	Malam	9	22.5
7	Moothiram	40	100
8	Naadi		
	a. Vatham	1	2.5
	b. Pitham	1	2.5
	c. Vatha Pitham	3	7.5
	d. Vatha Kapam	5	12.5
	e. Pitha vatham	19	47.5
	f. Pitha kapam	9	22.5
	g. Kapa pitham	2	5

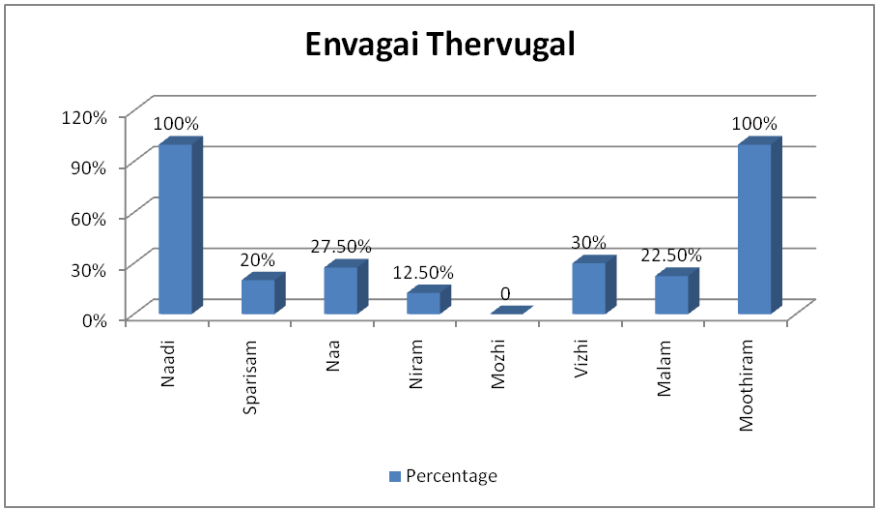


Fig-13

Inference:

In En vagaithervukal, Naadi was affected in all the 40 cases (100%), Sparisam was affected (numbness) in 8 cases (20%). Naa was affected (taste sensation) in 11 cases (27.5%). Niram was affected (pale/hypopigmentation) in 5 cases (12.5%). Vizhi was affected (vision) in 12 cases (30%).

Moothiram was found to be affected (burning micturition/oliguria/) in all the 40 cases (100%).

Distribution of Cases by Udal Kattugal

Table-14

Sl. No	Udal Kattugal	No of Cases	Percentage
1	Saaram	20	50
2	Sennar	8	20
3	Oon	7	17.5
4	Kozhuppu	10	25
5	Enbu	10	25
6	Moolai	-	-
7	Sukkilam / Suronitham	3	7.5

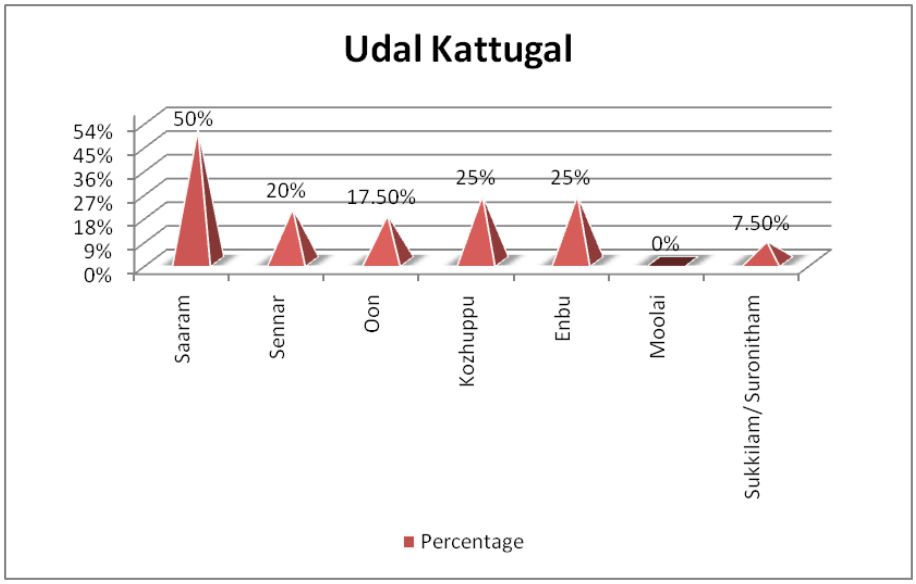


Fig-14

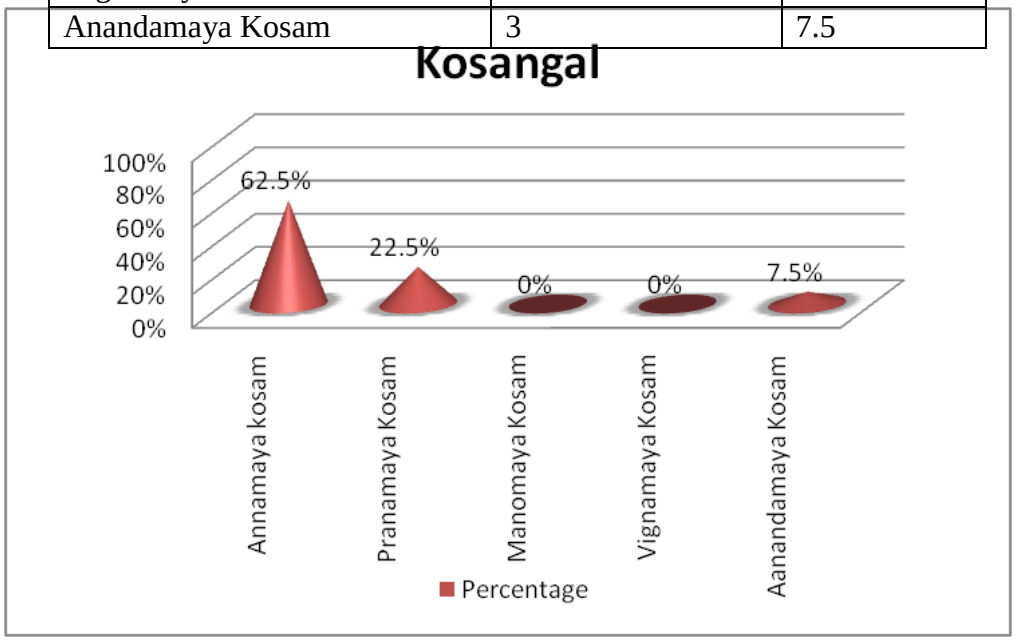
Inference:

Among40 patients, Saaram was affected(indigestion, general tiredness) in 20 cases(50%). Senneer was affected (reduction in Hb level) in 8 cases (20%).Oon was affected (increase muscle mass) in 7 cases (17.5%). Kozhuppu was affected (lower back ache) in 10 cases (25%). Enbu was affected (lower back ache, knee joint pain) in 10 cases (25%).Suronitham was affected (irregular menstruation) in 3 cases (7.5%).

Distribution of Cases by Kosangal

Table-**15**

Kosam	No of Cases	Percentage
Annamaya Kosam	25	62.5
Pranamaya Kosam	9	22.5
Manomaya Kosam	0	0
Vignamaya Kosam	0	0
Anandamaya Kosam	3	7.5



Inference:

Among 40 cases, Annamaya kosam was affected(abdominal pain/ anorexia) in 25 cases (62.5%), Pranamaya kosam was affected(cold, cough) in 19 cases (47.5)Anandamaya kosam was affected(sleep disturbance) in 3 cases (27.5%). Manomaya kosam, Vignamaya kosam were normal in almost all cases.

Distribution of Cases by Uyir Thathukkal

Vatham

Table-16

Sl. No	Classification of Vatham	No of Cases		Percentage	
		BT	AT	BT	AT
1	Pranan	9	4	22.5	10
2	Abanan	19	9	47.5	22.5
3	Udhanan	9	7	22.5	17.5
4	Samanan	40	31	100	77.5
5	Viyanan	40	24	100	60.5
6	Naagan	6	5	15	12.5
7	Koorman	6	6	15	15
8	Kirukaran	15	10	37.5	25
9	Devathathan	39	39	97.5	97.5
10	Dhananjayan	0	0	0	0

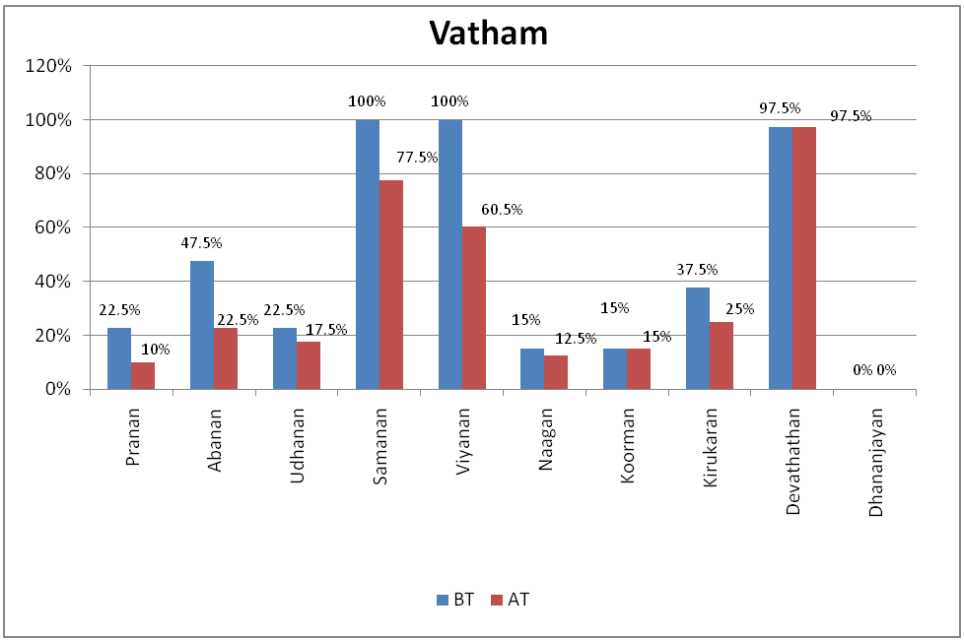


Fig-16

Inference:

Among 40 cases, Abaanan was affected(burning micturition) in 19 cases (47.5%), Pranan(anorexia) was affected in 9 cases(22.5%),Udhanan(nausea,vomiting) was affected in 9 cases(22.5%),Samanan(derangement of other vayukkal) ,Viyanan were affected(pain from loin to groin) in all the 40 cases (100%). Naagan was affected (dull vision) in 6 cases (15%), Koorman was affected (dull vision) in6 cases (15%) Kirukaran was affected (loss of appetite) in 15 cases (37.5%), Dhevathathan was affected (general tiredness) in49 cases (97.5%).

Pitham

Table-17

Sl. No	Classification of Pitham	No of Cases		Percentage	
		BT	AT	BT	AT
1	Anarpitham	15	8	37.5	20
2	Ranjagam	5	5	12.5	12.5
3	Saathagam	0	0	0	0
4	Alosakam	5	5	12.5	12.5
5	Prasakam	5	4	12.5	10

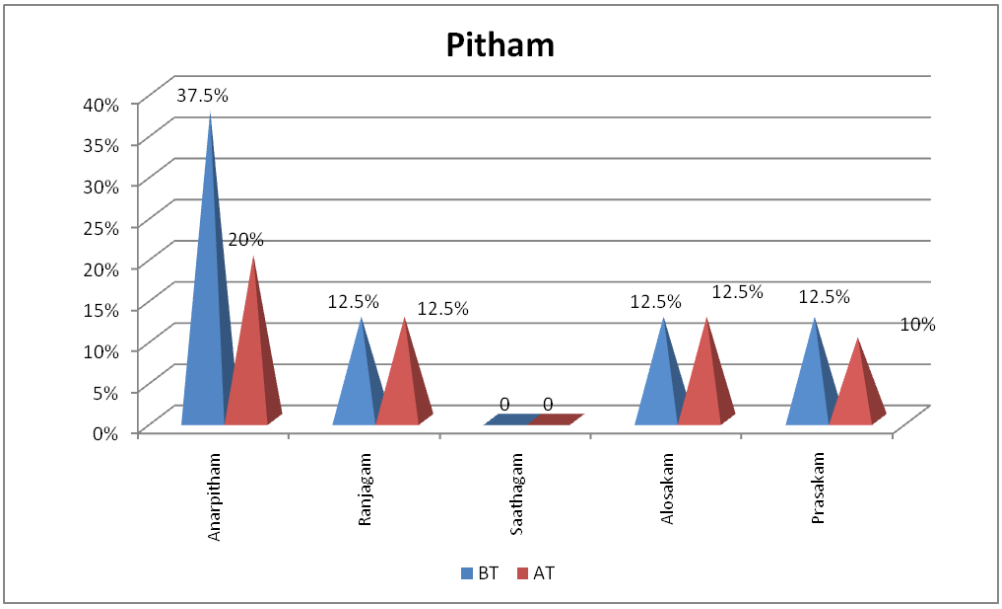


Fig-18

Inference:

Among 40 cases, .Anar pitham was affected(loss of appetite/abdominal pain) in 15 cases (37.5%), Ranjaga pitham was affected(Hb level was reduced) (in 5 cases (12.5%) , Alosaka pitham was affected(dull vision) in 5% cases (12.5%), Prasaka pitham was affected(paleness) in 5 cases (12.5%).

Kapam: **Table-18**

Sl. No	Classification of Kapam	No of Cases		Percentage	
		BT	**AT**	**BT**	**AT**
1	Avalambagam	33	16	82.5%	40%
2	Kelethagam	13	4	32.5%	10%
3	Pothagam	2	1	5%	2%
4	Tharpagam	21	4	52.5%	10%
5	Santhigam	9	8	22.5%	20%

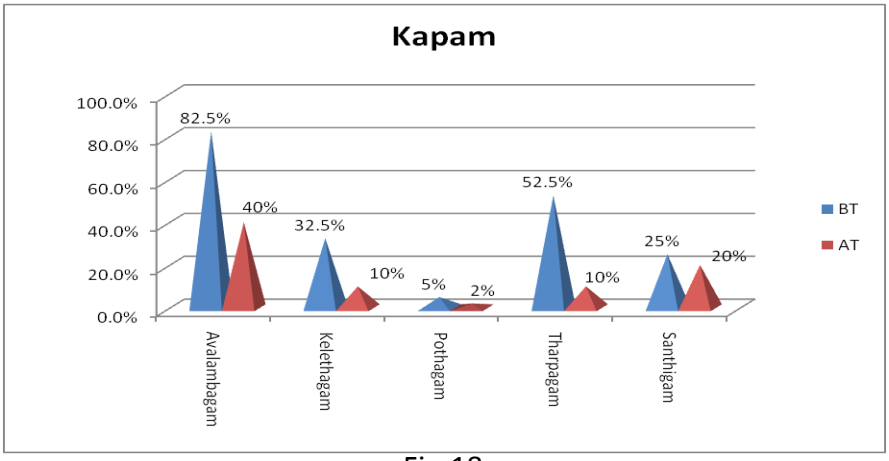


Fig-18

Inference:

Avalambagam was affected(derangement of other kapam) in 33 cases (82.5%),Kilethagam was affected(loss of appetite) in13 cases (32.5%), Pothagam was affected(tastelessness) in2 cases (5%), Tharpagam was affected(burning sensation of the eyes) in 21 cases (52.5%), Santhikam(lower back ache) was affected in 9 cases (22.5%).

Distribution of Cases by Neerkuri

Table-19

Sl. No	Neerin Niram	No of Cases		Percentage	
		BT	AT	BT	AT
1	Pale Yellow	23	24	57.5	60
2	Yellow	7	9	17.5	22.5
3	Dark yellow	0	1	0	2.5
4	Straw colour	2	1	5	2.5
5	Colourless	8	5	20	12.5

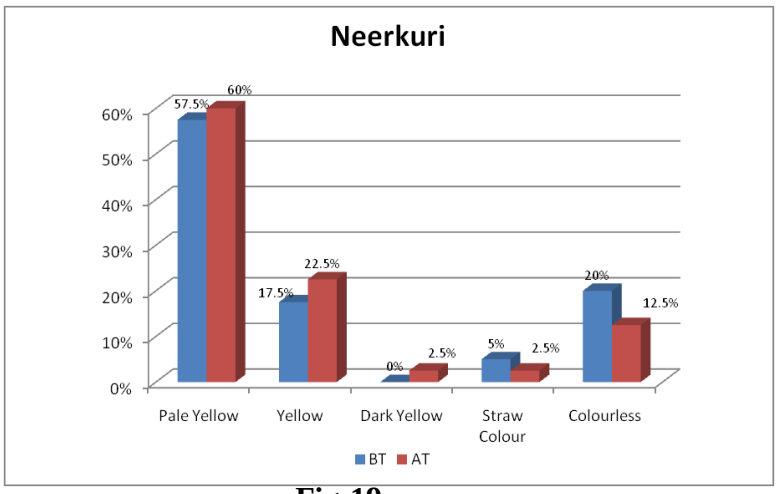


Fig-19

Inference:

Colour

In before treatment, pale yellow coloured urine was observed in 23 cases (57.5%) c (5%), yellow coloured urine was observed in 7 cases (17.5%),and colourless urine was observed in 8 cases (20%)

In after treatment, pale yellow coloured urine was observed in 24 cases (60%) , yellow coloured urine was observed in 9 cases (22.5%),dark yellow coloured urine was observed in one case(2.5%), straw coloured urine was observed in one case (2.5%), colourless urine was observed in 5 cases (12.5%).

Volume - The volume of urine was reduced in amount in 15 cases (37.5%), rest of cases had normal urine volume.

Manam-foul smell was observed only in 2 cases (5%)

Nurai-froth was observed only in one case (2.5%)

Edai, - Normal in all cases

Enjal- Enjal present in 2 cases (plenty of pus cells), inother cases it was normal.

Distribution of Cases By Neikuri

Table-20

Sl. No	Types	No of Cases		Percentage	
		BT	AT	BT	AT
1	Serpentine	0	0	0	0
2	Ring	1	1	2.5	2.5
3	Pearl	15	30	37.5	75
4	Round	10	6	25	15
5	Sieve	12	1	30	2.5
6	Others	2	2	5	5

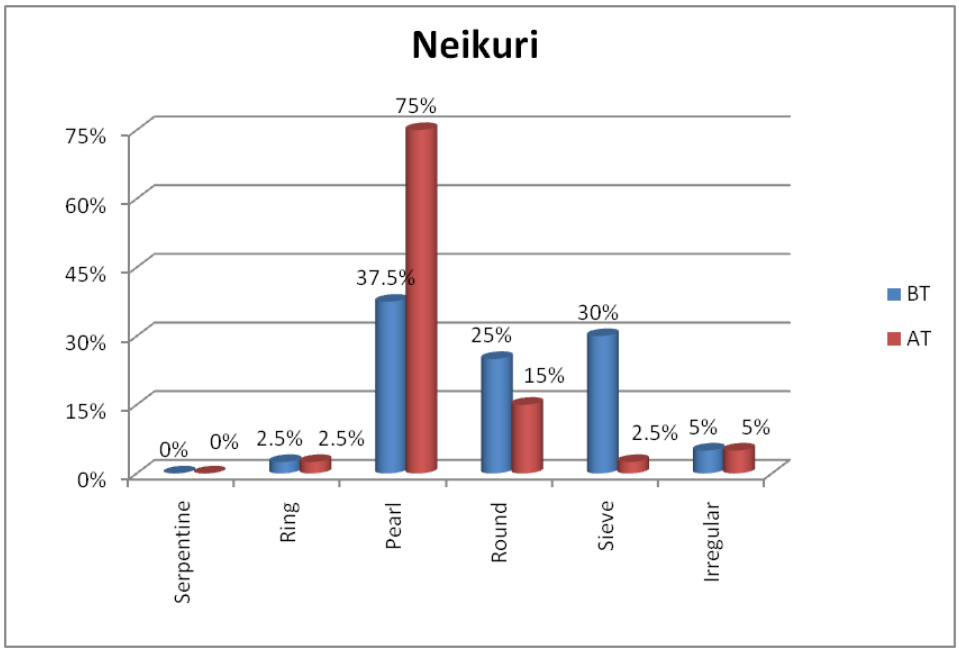


Fig-20

Inference:

Among 40 cases the neikuri in 15 cases (37.5%) the neikuri was observed as pearl shape (Kapha neer).In one case (2.5%)the neikuri was observed as ring shape (Azhal neer).In 10 cases (25%) the neikuri was observed as round shape.In 12 cases (30%) the neikuri was observed as sieve shape . In 2 cases (5%) the neikuri was observed as irregular shape.

Distribution of Cases by Chronicity of Illness

Sl. No	Duration of Illness	No of Cases	Percentage
1	0-3 months	12	30
2	4-6 months	9	22.5
3	7-9 months	5	12.5
4	Above 9 months	14	35

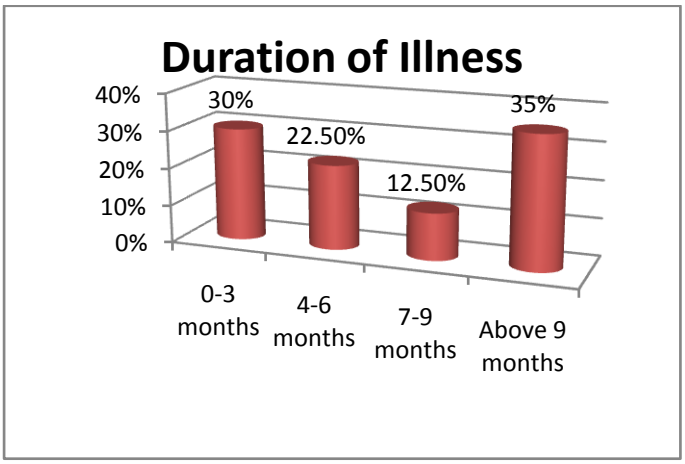


Fig-21

Inference:

Among 40 cases 0 to 3 months chronicity of illness was found in 12cases (30%), 4 to 6 months chronicity of illness was found in 9 cases (22.5%) ,7 to 9 months chronicity of illness was found in 5 cases (12.5%) , above 9 months chronicity of illness was found in14 case (35%) .

Distribution of Cases by Clinical features
Table-21

Sl. No	Clinical features	No of Cases	Percentage
1	Pain from loin to groin	29	72.5
2	Abdominal pain	22	55
3	Agonizing pain	4	10
4	Burning micturition	9	22.5
5	Oliguria	6	15
6	Nausea	1	2.5
7	Vomiting	1	2.5
8	Dysuria	6	15
9	Pain in Urethra	2	5

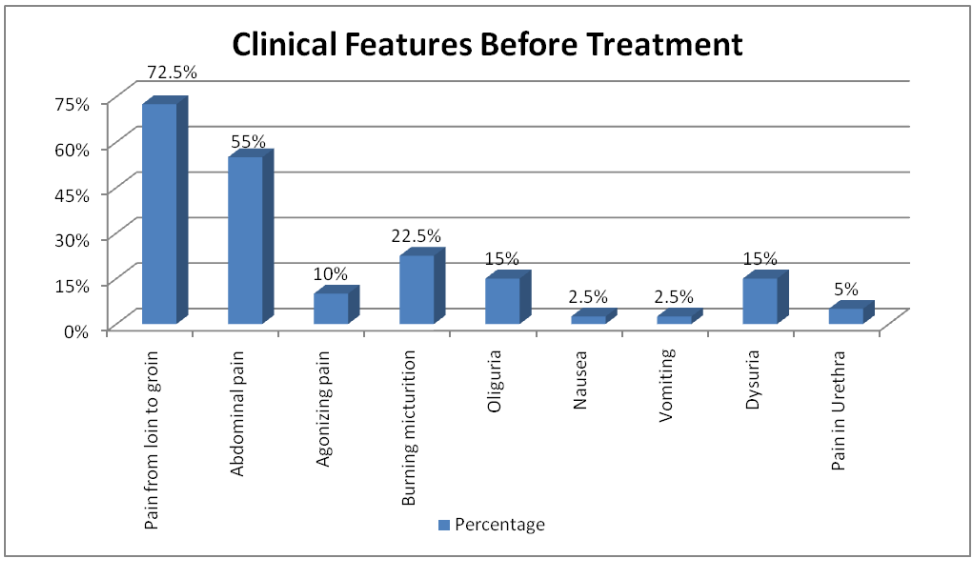


Fig-21

Inference:

In clinical features, all the 29 cases (72.5%) had pain from loin to groin region,9 cases(22.5%) had burning micturition , 22 cases (55%) had abdominal pain,one case (2.5%) had nausea,4 cases (10%) had agonizing pain,one case (2.5%) had vomiting, 6 cases (15%) had oliguria,6 cases (15%) had dysuria, and2 cases (5%) had pain in urethra.

Improvement of Clinical Features after treatment

Table-22

Sl. No	Improvement	No of Cases	Percentage
1	Good	22	55%
2	Moderate	13	32.5%
3	Poor	5	12.5%
4	Total	40	100%

Clinical Features After Treatment

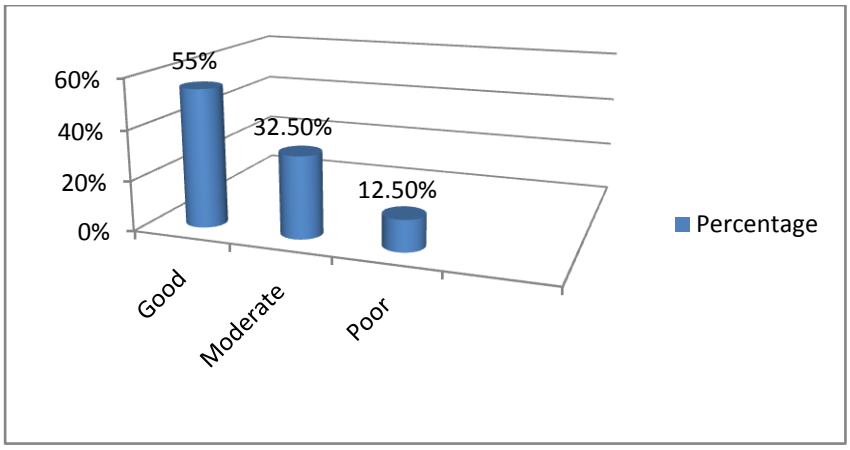


Fig-22

Improvement:

Among 40 cases 22cases (55%) had clinically good improvement (symptoms completely relieved) after treatment with study drug,13 cases (32.5%) had moderate improvement (symptoms reduced), 5 cases(12.5%) had no improvement.

Improvement in USG Abdomen

Table-22

Sl. No	Improvement	No of Cases	Percentage
1	Good	15	37.5%
2	Moderate	16	40%
3	Poor	9	22.5%

USG Abdomen

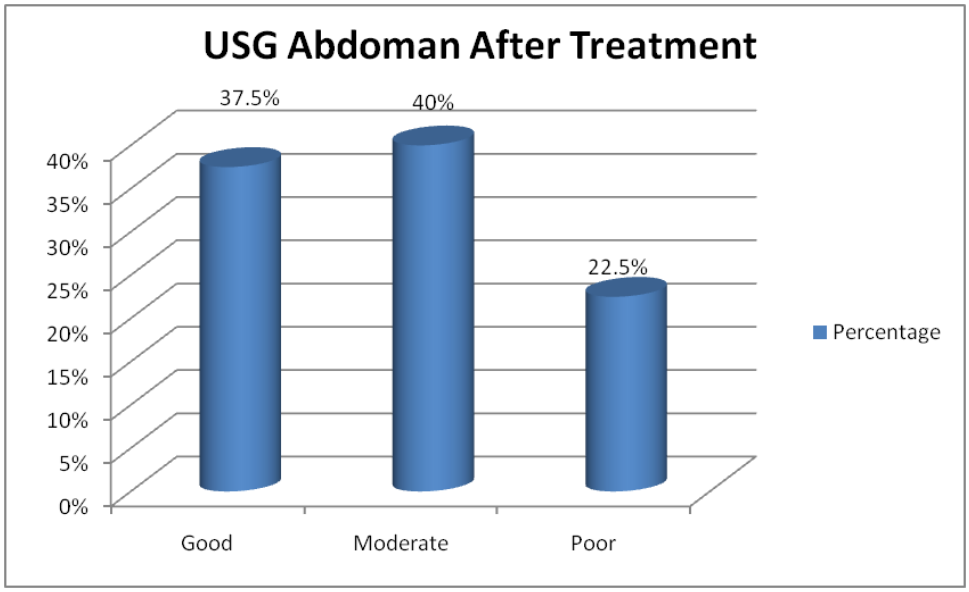


Fig-23

Inference:

Among 40 cases stone 15 cases had good improvement (stone completely dissolved), 16 cases (40%) cases had moderate improvement (number of stone and stone size-4 to10mm was reduced), 9cases (22.5%) showed poor response (no changes in number and size of the stone).

STATISTICAL ANALYSIS

All collected data were entered into MS Excel software using different columns as variables and rows as patients. SPSS software was used to perform statistical analysis. Basic descriptive statistics include frequency distributions and cross-tabulations were performed.

The quantity variables were expressed as Mean ± Standard Deviation and qualitative data as percentage. A probability value of <0.05 was considered to indicate as statistical significance.

Distribution of number of calculi before treatment

Table 1:

Number of calculi	Number of cases	Number of cases in percentage
1	12	30%
2	10	25%
3	6	15%
4	5	12.5%
5	3	7.5%
8	2	5%
9	1	2.5%

Distribution of number of calculi after treatment

Table2:

Number of calculi	Number of cases	Number of cases in percentage
0	14	40%
1	11	28%
2	6	15%
3	2	5%
4	1	2.5%
5	1	2.5%
6	2	5%
7	1	2.5%
8	1	2.5%

Distribution of number of cases before and treatment

Table:3

Number of calculi	Before and after treatment				Total number of cases
	0	1	2	>2	
1	5	6	1	0	12
2	5	3	2	0	10
3	4	1	1	0	6
>3	0	1	2	9	12

Out of 40 cases 12 cases are having one number of calculi. In 12 cases 5cases has got cleaned the calculusfrom the kidney,6 cases has got one calculi , one cases has got 2 calculi .

Out of 40 cases 10 cases are having 2 calculi .In 10 cases 5cases are cleared the calculi from the kidney,3 cases has got one calculus , 2 cases has got 2 calculi .

Out of 40 cases 6 cases are having three (3) calculi. In 6 cases 4 cases are cleared the calculi from the kidney, one cases has got onecalculus ,one cases has got 2 calculi. In the remaining 12 cases either one or two calculi has not been cleared from the kidney.

Treatment effect on number of calculi

Table:4

Group	Mean±Std	t value	P value
Before	2.82±2.05	5.77	0.0001%
After	1.66±2.11		

There is a significant reduction in number of calculi exists in the patients .The results reveals 42% reduction in number of calculi which is statistically siginificant (<0.0001)

Total size of renal calculi is measured by adding the length of the calculi obtained from theUSG abdomen. The result shows that

The size varies from 4 to 45 mm

1	4-6	10
2	6-8	6
3	8-10	7
4	10-12	0
5	12-14	3
6	14-16	3
7	16-18	1
8	18-20	3
9	>20	7

The size varies from 3.4 to 41.2mm

0	14
1	10
2	2
3	4
4	1
5	1
8	3
9	3

Treatment effect on size of calculi

Table:4

Group	Mean±Std	t value	P value
Before	12.61±9.12	5.42	0.0001%
After	7.34±9.26		

There is a significant reduction in size of calculi exists in the patients .The results reveals 42% reduction in number of calculi which is statistically siginificant (<0.0001)

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT						
SL.NO	OPD NO	AGE/SEX	Hb gm %		T.RBC mill/µl	
			BT	AT	BT	AT
1	I24184	30/19	15.7	16.7	5.3	5.5
2	R39175	54/F	13.2	12.7	5.0	4.8
3	H98065	26/F	13.1	13	4.5	4.5
4	T13626	41/F	11.5	12	3.7	3.8
5	J27576	38/F	12.1	11.7	4.6	4.6
6	H30190	25/M	14.8	14.8	4.9	4.8
7	I17346	37/M	16	16.1	5.2	5.3
8	H68985	32/M	16.8	14.6	5.9	4.9
9	I47697	52/M	14.5	15.1	4.7	4.9
10	I32545	56/F	13.1	13.7	5.0	5.2
11	I41220	28/M	15.4	15.1	5.3	5.2
12	I76332	48/F	11.4	10.6	4.8	5.0
13	E015989	58/M	14.8	15.1	5.3	5.3
14	H73783	26/F	9.1	9.7	3.9	4.2
15	I50768	33/M	14.1	14.9	4.5	4.5
16	I56310	29/M	13.8	13.9	4.6	4.6
17	I26784	39/M	15.3	15.1	5.4	5.3
18	I01756	60/M	13.6	13.5	4.4	4.4
19	I55334	26/M	16.2	15.6	5.6	5.3
20	I55616	44/M	15.5	16.00	5.4	5.5
21	I61203	34/M	15.7	15.0	5.5	5.3
22	I61285	45/M	15.9	15.1	5.8	5.5
23	I14652	29/M	15.7	14.7	5.4	5.6
24	I59235	27/F	12.8	12.9	4.8	5.0
25	I25479	20/F	11.6	11.5	4.6	4.5
26	I45578	30/M	16.6	16.2	5.5	5.4
27	I62094	27/M	15.0	15.0	5.0	5.1
28	H44868	42/F	11.4	10.6	4.1	4.0
29	I64463	36/F	13.6	13.1	4.5	4.2
30	H79813	36/F	8.7	9.6	4.1	4.6
31	H70471	26/F	12.7	13.1	4.4	4.5
32	I39495	32/F	14.2	13.6	5.0	5.0
33	I66809	29/F	12.2	11.5	4.4	4.1
34	I63770	34/F	12.3	12.5	4.5	4.5
35	H9394	28/M	15.4	14.5	5.2	4.9
36	I44707	37/F	12.4	12.5	4.8	4.9
37	I70641	40/F	13.8	13.4	5.0	4.8
38	H74488	26/M	15.3	6.1	5.4	5.7
39	I73515	43/F	10.6	10.5	5.2	5.6
40	i69309	30/F	12.3	11.7	4.5	4.3

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT				
S.NO	OPD NO	AGE/SEX	TC cells/µl	TC cells/µl
			BT	AT
1	I24184	30/M	8400	8400
2	I39175	54/F	6400	7300
3	H98065	26/F	8000	8100
4	I3626	41/F	5700	6700
5	I27576	38/F	8500	9400
6	H30190	25/M	6000	8100
7	I17346	37/M	10,700	8900
8	H68985	32/M	7900	7900
9	I47697	52/M	7100	7500
10	I32545	56/F	7800	7900
11	I41220	28/M	2200	8200
12	I76332	48/F	7600	7900
13	E015989	58/M	7900	8800
14	H73783	26/F	5800	7500
15	I50768	33/M	11,400	12500
16	D56310	29/M	5500	6200
17	I26784	39/M	68000	5400
18	I01756	60/M	6300	7300
19	I55334	26/M	6000	8200
20	I55616	44/M	6400	7000
21	I61203	34/M	5900	7200
22	I61285	45/M	7500	8300
23	I14652	29/M	6100	6200
24	I59235	27/F	7700	7900
25	I25479	20/F	8200	9000
26	I45578	30/M	5900	6000
27	I62094	27/M	7200	7000
28	H44868	42/F	8000	5600
29	I64463	36/F	8600	8000
30	H79813	36/F	10,700	9100
31	H70471	20/F	9500	8000
32	I38495	32/F	13900	9100
33	I66809	29/F	7300	7100
34	I63770	34/F	7100	6200
35	H9394	25/M	8900	7100
36	I44707	37/M	8000	7700
37	I70641	40/F	11,400	10,100
38	H74488	26/M	5700	6100
39	H73575	43/F	8000	6500
40	I69309	30/F	8400	7600

BLOOD INVESTIGATION BEFORE TREATMENT															
SL. NO	OPD NO	AGE/SEX	DC%					ESR mm/hr		BLOOD					
			P	L	M	E	B	½ hr	1hr	Sugar mg/dl		Urea mg/dl	S.creatnine mg/dl	S. Uric Acid mg/dl	
										F	PP				
1	I24184	30/M	66	29	01	04	---	2	4	80	135	18	1.0	7.9	
2	I39175	54/F	54	40	02	04	---	8	16	71	74	15	0.8	4.0	
3	H98065	26/F	58	36	02	04	---	6	12	65	120	10	0.7	2.4	
4	I13626	41/F	64	30	02	06	---	2	4	73	74	19	0.8	3.5	
5	I27576	38/F	75	22	--	03	---	4	8	84	128	17	0.8	4.0	
6	H30190	25/M	63	30	02	05	---	6	12	76	83	25	0.9	4.3	
7	I17346	37/M	60	34	02	04	---	6	12	68	125	16	1.0	6.6	
8	H68985	32/M	40	43	01	16	---	2	4	76	110	17	1.1	6.9	
9	I47697	52/M	65	30	01	04	---	6	12	76	97	25	1.0	7.4	
10	I32545	56/F	54	42	01	03	---	14	30	87	110	16	0.9	4.9	
11	I41220	28/M	50	46	00	04	---	8	16	75	151	18	0.9	5.8	
12	I76332	48/F	56	39	02	02	---	8	14	76	110	20	0.8	4.5	
13	F015989	58/M	65	27	00	08	---	10	22	80	114	23	1.2	6.7	
14	H73783	26/F	49	46	01	04	---	12	26	71	72	10	0.8	4.6	
15	I50768	33/M	65	27	02	05	---	8	16	73	101	11	1.0	5.4	
16	I56310	29/M	65	30	02	03	---	10	20	100	95	11	0.9	4.8	
17	I26784	39/M	56	39	01	04	---	40	8	69	72	14	1.0	4.7	
18	I01756	60/M	60	34	02	04	---	12	24	89	98	17	1.0	4.8	
19	I55334	26/M	55	40	00	05	---	2	4	102	114	15	1.0	7.2	
20	I55616	44/M	50	44	02	04	---	8	16	90	103	17	1.0	5.2	

BLOOD INVESTIGATION BEFORE TREATMENT															
SL. NO	OPD NO	AGE/SEX	DC%					ESR mm/hr		BLOOD					
			P	L	M	E	B	½ hr	1hr	B.Sugar mg/dl		S.Urea mg/dl	S.creatinine mg/dl	S. Uric Acid mg/dl	
										F	PP				
21	I61203	34/M	62	32	02	04	---	2	4	97	136	20	1.1	4.3	
22	I61285	45/M	60	33	02	05	---	4	8	107	135	20	1.2	3.8	
23	I14652	29/M	60	34	02	04	---	30	42	111	133	16	1.0	4.8	
24	I59235	27/F	54	43	01	02	---	40	82	96	114	11	0.9	5.7	
25	I25479	20/F	65	30	00	05	---	10	22	105	123	09	0.8	3.4	
26	I45578	30/M	48	46	02	04	---	6	12	109	118	24	1.0	3.8	
27	I62094	27/M	59	34	02	05	---	6	12	98	130	18	1.0	4.6	
28	H44868	42/F	70	24	01	05	---	30	62	97	121	15	0.8	3.3	
29	I64463	36/F	60	34	01	05	---	4	8	100	120	16	1.1	3.6	
30	H79813	36/F	70	26	01	04	---	16	32	87	130	9	0.7	3.8	
31	H70471	26/F	58	38	01	03	---	18	26	87	120	14	0.8	4.2	
32	I38495	32/F	65	28	02	05	---	8	18	99	140	18	0.8	3.9	
33	I66809	29/F	60	37	03	00	---	12	26	92	124	13	0.8	4.5	
34	I63770	34/F	60	33	02	05	---	16	32	98.1	92	17.6	0.89	4.6	
35	H9394	20/M	62	29	02	07	---	04	08	108	101	13	1.0	5.4	
36	I44707	37/F	55	40	01	04	---	16	32	99	124	13	0.9	4.7	
37	I70641	40/F	68	29	01	02	---	12	24	106	131	12	1.0	5.1	
38	H74488	26/M	51	44	03	02	---	4	10	110	130	16	0.9	6.9	
39	I7357	43/F	62	33	01	04	---	4	8	105	123	12	0.8	4.4	
40	I69309	30/F	75	20	01	04	---	6	120	105	132	0.6	0.7	4.5	

BLOOD INVESTIGATION AFTER TREATMENT															
SL. NO	OPD NO	AGE/SEX	DC%					ESR mm/hr		BLOOD					
			P	L	M	E	B	½ hr	1hr	Sug mg/dl		Urea mg/dl	S.Crea mg/dl	S.Uric Acid mg/dl	
										F	PP				
1	I24184	30/M	66	28	02	04	---	2	4	94	144	14	1.2	6.4	
2	I39175	54/F	60	36	00	04	00	14	28	97	123	16	0.8	3.5	
3	H98065	26/F	55	39	02	04	---	10	22	93	97	10	0.8	2.6	
4	I13626	41/F	55	40	--	05	---	4	8	97	110	19	0.9	3.3	
5	I27576	38/F	70	26	--	04	---	16	32	118	130	09	0.9	4.5	
6	H30190	25/M	66	29	02	03	---	4	8	97	131	23	1.0	5.6	
7	I17346	37/M	55	42	01	02	---	10	20	103	130	19	1.0	7.5	
8	H68985	32/M	45	40	01	14	---	2	4	97	100	15	1.1	8.3	
9	I47697	52/M	65	30	--	05	---	8	16	105	164	15	1.0	5.9	
10	I32545	56/F	60	38	--	02	---	14	30	108	107	23	0.9	4.1	
11	I41220	28/M	56	41	01	02	---	14	28	116	170	19	1.0	6.3	
12	I76332	48/F	61	36	01	02	---	6	12	110	100	14	1.0	4.5	
13	F015989	58/M	60	32	00	08	---	6	12	87	142	20	1.4	6.6	
14	H73783	26/F	55	40	02	03	---	10	22	88	102	15	0.8	4.1	
15	I50768	33/M	65	27	02	05	---	4	8	92	130	12	1.2	5.1	
16	I56310	29/M	68	25	02	05	---	6	12	97	120	15	1.0	7.4	
17	I26784	39/M	60	34	02	04	---	6	12	89	117	17	1.2	5.8	
18	I01756	60/M	60	33	03	04	---	4	8	86	113	15	1.1	5.7	
19	I55334	26/M	62	32	02	04	---	4	8	97	130	20	1.1	7.5	
20	I55616	44/M	66	29	02	03	---	10	22	96	100	12	0.8	7.1	

BLOOD INVESTIGATION AFTER TREATMENT															
S.No	OPD NO	AGE/SEX	DC%					ESR mm/hr		BLOOD					
			P	L	M	E	B	½ hr	1hr	Sug mg/dl		Urea mg/dl	S.Crea mg/dl	S.Uric Acid mg/dl	
										F	PP				
21	I61203	34/M	64	31	02	03	---	2	4	111	132	08	1.0	5.2	
22	I61285	45/M	72	23	02	03	--	2	4	101	130	20	1.2	4.7	
23	I14652	29/M	64	31	01	04	---	2	4	111	132	08	1.0	5.2	
24	I59235	27/F	59	38	--	03	---	20	40	91	112	12	0.9	5.7	
25	I25479	20/F	68	29	01	02	---	30	62	100	120	22	1.0	4.1	
26	I45578	30/M	50	44	02	04	---	4	8	96	131	17	1.1	3.7	
27	I62094	27/M	65	30	01	04	---	6	10	110	130	18	1.1	4.1	
28	H44868	42/F	64	32	02	02	---	8	16	95	111	18	0.9	2.5	
29	I64463	36/F	65	30	02	03	---	10	20	109	98	13	0.9	5.1	
30	H79813	36/F	69	26	01	04	---	20	42	85	96	09	0.7	4.0	
31	H70471	26/F	65	32	01	02	---	18	36	111	96	16	0.7	5.0	
32	I38495	32/F	61	31	02	06	---	2	6	92	111	13	0.9	2.7	
33	I66809	29/F	56	40	--	04	---	16	32	84	120	14	0.9	4.6	
34	I63770	34/F	62	34	01	03	---	42	86	95	88	18	0.9	4.8	
35	H9394	20/M	59	31	04	06	---	2	4	92	89	24	1.1	5.4	
36	I44707	37/F	63	35	00	02	---	10	22	88	91	09	1.0	5.3	
37	I70641	40/F	66	31	00	03	---	12	26	91	110	14	1.1	4.7	
38	H74488	26/M	45	45	02	08	---	2	6	101	--	15	1.0	6.0	
39	I73575	43/F	62	32	02	04	---	4	8	86	120	10.5	0.9	2.9	
40	I69309	30/F	69	27	01	03	---	3	6	100	133	060.9	0.7	3.5	

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT												
SL. NO	OPD NO	AGE/SEX	BEFORE TREATMENT					AFTER TREATMENT				
			PCV %	MCV %ft	MCH pg	MCHC gm/dl	PLA lkh/µl	PCV%	MCV %ft	MCH pg	MCHC gm/dl	PLATE lkh/µl
1	I24184	30/M	46.6	86.5	29.1	33.7	3.1	49.4	88.5	29.9	33.8	3.5
2	I39175	54/F	40.7	81.2	26.3	32.4	3.0	39.4	81.7	26.3	32.2	3.0
3	H98065	26/F	38.5	84.4	28.7	34	2.2	39	86.5	28.8	33.3	2.7
4	I13626	41/F	34.5	92.5	30.8	33.3	2.3	35.9	93.2	31.2	33.4	2.1
5	I27576	38/F	37.2	79.7	25.9	32.5	4.5	36	77.4	25.2	32.5	5
6	H30190	25/M	43	87.6	30.1	34.4	3.3	43.7	90.3	30.6	33.9	3.4
7	I17346	37/M	44.2	85	30.8	36.2	3.1	45	84.9	30.4	35.8	3.2
8	H68985	32/M	48.5	81.5	28.2	34.6	3.1	42	85.5	29.7	34.8	3.0
9	I47697	52/M	44.7	89.8	30.83	33.8	2.7	42.2	89.0	30.6	34.4	2.6
10	I32545	56/F	40.1	79.9	26.7	33.4	2.2	42	80.2	26.1	32.6	1.9
11	I41220	28/M	44.7	83.1	28.6	34.5	2.5	44.6	84.8	28.7	33.9	2.3
12	I76332	48/F	37.2	85.0	28.2	33.3	2.2	35.2	84.2	28.6	33.7	2.0
13	F015989	58/M	43.9	82.4	27.8	33.7	2.8	43.8	81.4	28.1	34.5	2.6
14	H73783	26/F	29	74.2	23.3	31.4	3.3	31.1	73.5	22.9	31.2	3.7
15	I50768	33/M	41.9	91.5	31.2	34.1	3.5	44	95.9	32.5	33.9	4.0
16	I56310	29/M	39.8	85.4	29.6	34.7	2.4	40.6	87.7	29.6	33.7	2.5
17	I26784	39/M	46.7	86.0	28.2	32.8	1.9	46	85.8	28.2	32.8	2.0
18	I01756	60/M	38.5	86.5	30.6	35.3	2.00	38.3	86.5	30.2	35.2	2.8
19	I55334	26/M	46.7	83.2	28.9	34.9	2.2	45.3	84.0	28.9	34.4	2.1
20	I55616	44/M	44.9	82.8	28.6	34.5	3	45	84	30	35.4	3.1

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT												
SL. NO	OPD NO	AGE/SEX	BEFORE TREATMENT					AFTER TREATMENT				
			PCV %	MCV %ft	MCH pg	MCHC gm/dl	PLA lkh/µl	PCV%	MCV %ft	MCH pg	MCHC gm/dl	PLA lkh/µl
21	I61203	34/M	47.8	86.8	28.5	32.8	3.4					
22	I61285	45/M	46.4	79.3	27.2	34.3	1.6	43.6	79.3	27.5	34.6	1.6
23	I14652	29/M	46.2	84.2	28.6	34.0	2.2	44.0	87.0	29.1	33.4	2.2
24	I59235	27/F	39.5	81.4	26.4	32.4	4.8	40.5	80.8	25.7	31.9	4.0
25	I25479	20/F	37.3	80.7	25.1	31.1	3.7	36.9	81.1	25.3	31.2	3.2
26	I45578	30/M	49.7	88.9	29.7	33.4	2.8	47.6	88.1	30.0	34	28
27	I62094	27/M	44.3	87.9	29.8	33.9	2.4	44.0	27.0	27.5	31.8	2.5
28	H44868	42/F	34.0	82.9	27.8	33.5	3.6	33.8	83.5	26.2	31.4	3.2
29	I64463	36/F	39.6	86.7	29.8	34.3	2.9	44.0	87.0	29	32.7	2.1
30	H79813	36/F	29.5	71.6	21.1	29.5	4.1	30.7	76.0	23.8	31.3	42
31	H70471	26/F	38.8	88.2	28.9	32.7	3.7	39.9	87.9	28.9	32.8	3.8
32	I38495	32/F	43.3	85.2	28	32.8	2.3	41.2	86.2	28.5	33.0	2.5
33	I66809	29/F	36.0	81.3	27.5	33.9	2.3	33.9	81.9	27.8	33.9	2.6
34	I63770	34/F	37.9	82.6	26.8	32.5	3.6	38.4	84.2	27.4	32.6	3.6
35	H9394	20/M	45.5	86.8	29.4	33.8	2.6	42.9	86.5	29.2	33.8	2.6
36	I44707	37/F	37.8	78.6	25.8	32.8	2.9	38.2	77.8	25.5	32.7	2.8
37	I70641	40/F	40.8	81.4	27.5	33.8	3.2	40.4	82.6	27.4	33.2	3.1
38	H74488	26/M	46.1	84.1	27.9	33.2	1.9	47.8	82.7	27.9	33.7	1.8
39	I73575	43/F	34.0	82	27.5	32.5	2.4	33.7	79.9	24.9	31.2	1.9
40	I69309	30/F	37.3	81.3	26.8	33.0	3.8	36.5	83.1	26.7	32.1	3.0

BLOOD INVESTIGATION BEFORE TREATMENT																		
SL. NO	**OPD NO**	**AGE/ SEX**	**T.Bilirubin mg/dl**	**D.Bili mg/dl**	**ID.Bilirubin mg/dl**	**SGOT IU/L**	**SGPT I/UL**	**S. ALP IU/L**	**T.Protein gm/dl**	**S.Albumin gm/dl**	**S.Globi gm/dl**	**S.Calcium mg/dl**	**S.phos mg/dl**	**T.Chomg/dl**	**HDL mg/dl**	**LDL mg/dl**	**VLDL mg/dl**	**TGL mg/dl**
1	I24184	30/M	0.9	0.3	0.6	29	44	72	7.8	4.8	3.0	9.6	3.0	220	50	129	32	158
2	I39175	54/F	1.0	0.4	0.6	19	14	69	7.4	4.4	3	9	4.7	234	90	129	14	71
3	H98065	26/F	0.5	0.2	0.3	15	11	62	7.6	4.5	3.1	9.1	3.2	180	62	105	17	83
4	I13626	41/F	1.0	0.4	0.6	15	14	41	6.6	4.0	2.6	8.7	3.1	149	55	79	16	78
5	I27576	38/F	0.2	0.1	0.1	22	17	73	7.5	4.3	3.2	8.7	2.8	158	54	103	29	146
6	H30190	25/M	0.7	0.3	0.4	19	26	71	7.1	4.5	2.6	8.5	3.5	160	56	87	11	53
7	I17346	37/M	0.3	0.1	0.2	20	27	56	6.8	4.2	2.6	8.2	3.9	125	35	70	24	119
8	H68985	32/M	0.8	0.3	0.5	25	33	78	7.9	4.7	3.2	8.9	3.0	180	38	106	23	113
9	I47697	52/M	0.8	0.3	0.5	16	26	78	7.5	4.3	3.2	9.0	3.1	7.4	49	85	29	144
10	I32545	56/F	0.8	0.3	0.5	18	19	45	6.9	4.2	2.7	9	3.3	136	38	81	26	130
11	I41220	28/M	0.6	0.2	0.4	27	34	137	7.8	4.5	3.3	9.2	2.5	148	39	90	24	121
12	I76332	48/F	0.6	0.2	0.3	21	17	45	7.6	4.5	3.1	9.1	3.7	180	62	105	18	83
13	F015989	58/M	0.4	0.2	0.2	21	27	84	7.1	4.3	2.8	8.8	2.8	110	52	61	15	76
14	H73783	26/F	0.5	0.2	0.3	11	10	64	7.0	4.2	2.8	7.7	3.1	136	46	80	17	87
15	I50768	33/M	0.8	0.3	0.5	22	29	79	7.0	4.6	2.4	8.5	2.5	150	52	76	15	73
16	I56310	29/M	0.7	0.3	0.4	11	6	55	7.2	4.3	2.9	8.3	3.5	132	42	81	14	72
17	I26784	39/M	1.1	0.4	0.7	18	22	53	6.8	4.3	2.5	8.3	2.4	160	53	91	15	75
18	I01756	60/M	0.6	0.3	0.3	15	12	38	6.7	4.5	2.3	9.1	3.7	124	35	71	27	134
19	I55334	26/M	0.8	0.2	0.6	24	31	126	7.5	4.1	3.4	7.5	2.1	163	45	100	20	99
20	I55616	44/M	0.8	0.3	0.5	22	25	97	6.8	4.1	2.6	7.9	2.9	148	53	86	19	97

BLOOD INVESTIGATION BEFORE TREATMENT																		
SL. NO	**OPD NO**	**AGE/ SEX**	**T.Bilirubin mg/dl**	**D.Bili mg/dl**	**ID.Bilirubin mg/dl**	**SGOT IU/L**	**SGPT I/UL**	**S. ALP IU/L**	**T.Protein gm/dl**	**S.Albumin gm/dl**	**S.Globi gm/dl**	**S.Calcium mg/dl**	**S.phos mg/dl**	**T.Ch mg/dl**	**HDL mg/dl**	**LDL mg/dl**	**VLDL mg/dl**	**TGL mg/dl**
21	I61203	34/M	0.7	0.2	0.5	18	20	73	7.0	4.0	3.1	7.5	1.3	122	42	65	37	184
22	I61285	45/M	0.5	0.2	0.3	20	24	67	7.2	4.1	3.1	7.9	1.6	150	46	89	18	92
23	I14652	29/M	0.7	0.2	0.5	14	15	54	7.6	4.3	3.2	8.5	2.2	202	42	121	37	187
24	I59235	27/F	0.5	0.2	0.3	14	20	67	7.4	4.2	3.2	7.8	4.0	162	48	97	25	126
25	I25479	20/F	0.4	0.2	0.2	13	10	70	7.2	4.1	3.1	7.9	2.5	150	46	89	21	107
26	I45578	30/M	0.6	0.2	0.4	16	31	97	7.4	4.4	3.0	8.1	4.0	165	41	97	39	198
27	I62094	27/M	1.1	0.4	0.7	34	47	71	7.0	4.3	2.7	8.6	3.3	170	57	100	13	663
28	H44868	42/F	0.4	0.2	0.2	16	11	75	7.2	4.0	3.2	7.5	3.2	158	47	94	26	130
29	I64463	36/F	0.6	0.3	0.3	15	10	71	7.1	4.6	2.6	9.0	3.2	174	57	94	18	90
30	H79813	36/F	0.3	0.1	0.2	12	12	78	7.4	4.2	3.1	7.5	3.6	153	43	91	18	88
31	H70471	26/F	0.3	0.1	0.2	14	16	56	7.3	4.3	3.0	8.1	3.2	164	56	94	23	115
32	I38495	32/F	1.2	0.4	0.8	14	12	73	7.1	4.1	3.0	8.7	3.8	204	62	123	30	152
33	I66809	29/F	0.7	0.3	0.4	16	12	50	7.2	4.3	3.0	8.0	3.2	151	48	84	33	167
34	I63770	34/F	0.5	0.2	0.3	18	16	59	7.0	4.0	3.0	9.4	3.4	187	49	124	14	71
35	H9394	20/M	0.3	0.1	0.2	16	13	58	7.4	4.2	3.1	9.1	3.6	106	37	59	11	59
36	I44707	37/F	0.6	0.2	0.4	15	27	94	7.2	4.5	2.7	9.1	3.4	197	56	120	19	96
37	I70641	40/F	0.6	0.2	0.3	12	07	84	7.0	4.1	3.0	8.4	3.0	166	59	94	20	104
38	H74488	26/M	0.9	0.4	0.5	16	27	81	7.1	4.3	2.7	8.9	3.3	194	69	100	28	140
39	I73575	43/F	0.4	0.2	0.2	16	11	75	4.0	3.2	4.0	7.8	3.0	157	46	90	26	130
40	I69309	30/F	0.8	0.3	0.5	13	18	90	7.0	4.2	2.8	8.8	3.1	177	57	105	10	49

BLOOD INVESTIGATION AFTER TREATMENT																		
SL. NO	**OPD NO**	**AGE/ SEX**	**T.Bili rubin mg/dl**	**D.Bili mg/dl**	**ID.Bili rubin mg/dl**	**SG OT IU/L**	**SG PT I/UL**	**S. ALP IU/L**	**T.Prot ein gm/dl**	**S.Alb umin gm/dl**	**S.Globi gm/dl**	**S.Cal cium mg/dl**	**S.ph os mg/ dl**	**T.Ch omg/ dl**	**HD L mg/ dl**	**LD L mg/ dl**	**VL DL mg/ dl**	**TG L mg/ dl**
1	I24184	30/M	0.5	0.2	0.3	17	24	93	7.5	4.5	3.0	8.3	2.2	183	48	114	23	114
2	I39175	54/F	1.1	0.4	0.7	21	17	61	7.3	4.2	3.1	7.9	3.6	210	79	123	14	68
3	H98065	26/F	0.5	0.2	0.3	13	10	74	7	4.4	3.3	8.6	2.9	195	62	115	20	99
4	I13626	41/F	1	0.5	0.5	13	11	40	6.8	4.0	2.8	8.3	3.0	115	56	64	13	67
5	I27576	38/F	0.2	0.1	0.1	12	15	68	7.3	3.9	3.4	8.7	3.3	158	54	90	35	175
6	H30190	25/M	0.9	0.4	0.5	24	50	75	7.5	4.7	2.8	9.3	3.4	165	61	98	13	67
7	I17346	37/M	0.8	0.3	0.5	18	19	45	6.9	4.2	2.7	9	3.3	136	38	81	26	130
8	H68985	32/M	0.3	0.2	0.1	41	51	102	7.1	4.2	3.0	8.7	4.0	129	29	83	50	251
9	I47697	52/M	0.6	0.2	0.4	14	18	86	7.0	4.1	2.9	8.5	3.7	124	46	69	28	139
10	I32545	56/F	0.5	0.2	0.3	8	11	114	7.7	4.5	3.2	11	2.4	170	47	96	32	161
11	I41220	28/M	0.9	0.4	0.5	22	31	135	7.5	4.5	2.9	9	2.9	154	37	101	15	74
12	I76332	48/F	0.6	0.2	0.4	13	11	68	7.5	4.7	2.8	8.2	3.3	115	56	64	35	120
13	F015989	58/M	0.5	0.2	0.3	17	23	84	6.8	4.2	2.6	8.4	2.8	183	47	49	11	56
14	H73783	26/F	0.7	0.3	0.4	15	13	66	7.5	4.6	2.9	8.9	4.0	164	54	86	20	99
15	I50768	33/M	0.7	0.3	0.4	11	6	55	7.2	4.3	2.9	8.3	3.5	132	42	81	14	72
16	I56310	29/M	0.4	0.2	0.2	18	10	51	7.0	4.4	2.6	9.3	3.6	145	50	77	88	38
17	I26784	39/M	0.9	0.4	0.5	17	17	56	7.1	4.3	2.7	8.5	3.4	156	44	89	19	93
18	I01756	60/M	0.6	0.3	0.3	15	11	48	6.7	4.4	2.3	9.3	3.0	123	46	65	21	107
19	I55334	26/M	0.4	0.2	0.2	17	31	147	7.1	4.3	2.8	4.3	2.8	169	47	92	22	110
20	I55616	44/M	0.7	0.3	0.4	8	17	113	6.8	4.0	2.8	8.4	2.8	120	56	64	13	100

BLOOD INVESTIGATION AFTER TREATMENT																		
SL. NO	**OPD NO**	**AGE/ SEX**	**T.Bilirubin mg/dl**	**D.Bili mg/dl**	**ID.Bilirubin mg/dl**	**SGOT IU/L**	**SGPT I/UL**	**S. ALP IU/L**	**T.Protein gm/dl**	**S.Albumin gm/dl**	**S.Globi gm/dl**	**S.Calcium mg/dl**	**S.phos mg/dl**	**T.Ch mg/dl**	**HDL mg/dl**	**LDL mg/dl**	**VLDL mg/dl**	**TGL mg/dl**
21	I61203	34/M	0.7	0.2	0.5	20	22	64	6.4	3.2	3.2	9.0	2.5	150	45	85	30	120
22	I61285	45/M	0.6	0.3	0.3	23	27	65	6.7	3.9	3.0	8.5	2.9	142	48	86	31	154
23	I14652	29/M	0.7	0.2	0.5	14	15	54	7.6	4.3	3.2	8.5	2.2	202	42	121	37	187
24	I59235	27/F	0.4	0.1	0.2	12	20	69	7.7	4.4	3.3	8.6	2.6	166	47	88	25	129
25	I25479	20/F	0.3	0.1	0.2	15	9	73	7.5	4.4	3.1	9.3	4.1	156	42	84	15	77
26	I45578	30/M	0.7	0.4	0.3	16	21	95	7.2	4.3	3.0	8.9	3.7	135	40	82	48	241
27	I62094	27/M	0.6	0.3	0.3	18	20	52	7.4	4.2	3.1	9.1	2.3	150	41	84	23	120
28	H44868	42/F	0.4	0.2	0.2	25	17	76	7.3	4.3	2.7	8.8	3.0	176	48	99	19	97
29	I64463	36/F	0.6	0.3	0.3	15	10	71	7.1	4.6	2.6	9.0	3.2	174	57	94	18	90
30	H79813	36/F	0.3	0.1	0.2	13	08	79	7.1	4.0	3.1	7.5	3.2	164	43	96	20	101
31	H70471	26/F	0.3	0.1	0.2	14	16	56	7.3	4.3	3.0	8.1	3.2	164	56	94	23	145
32	I38495	32/F	1.2	0.5	0.7	16	09	67	7.0	4.2	2.8	8.5	3.4	162	96	50	19	96
33	I66809	29/F	0.5	0.2	0.3	20	18	57	6.9	4.1	3.0	9.5	3.5	133	44	79	36	183
34	I63770	34/F	0.5	0.2	0.3	18	16	59	7.0	4.0	3.0	9.4	3.4	187	49	124	14	71
35	H9394	20/M	0.5	0.2	0.3	25	24	53	8.0	4.1	4.0	8.8	2.9	107	35	54	10	50
36	I44707	37/F	0.6	0.2	0.4	14	14	91	6.8	4.4	2.5	9.1	3.3	184	47	107	14	72
37	I70641	40/F	0.5	0.2	0.3	15	11	88	6.8	3.8	3.0	7.9	3.1	166	57	93	19	94
38	H74488	26/M	1.5	0.7	0.9	14	29	83	7.3	4.4	3.0	9.6	4.1	217	68	134	34	171
39	I73575	43/F	0.5	0.2	0.3	14	19	65	8.0	3.7	4.0	7.8	3.0	157	46	90	24	123
40	I69309	30/F	0.6	0.3	0.3	19	14	76	6.5	3.9	3.0	9.7	3.3	162	48	108	15	74

URINE ANALYSIS BEFORE AND AFTER TREATMENT																
SL. NO	OPD NO	AGE/ SEX	BEFORE TREATMENT							AFTER TREATMENT						
			Alb	Sug	Deposit		BS	BP	Uro	Alb	Sug	Deposit		BS	BP	Uro
					Pus Cell	Epi cell						Pus Cell	Epi cell			
1	I24184	30/M	Nil	Nil	3-5	2-4	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	N
2	I39175	54/F	Nil	Nil	1-2	1-3	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	N
3	H98065	26/F	Nil	Nil	2-4	2-4	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	N
4	I13626	41/F	Nil	Nil	1-2	2-4	Nil	Nil	N	Nil	Nil	4-5	2-3	Nil	Nil	N
5	I27576	38/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	N
6	H30190	25/M	Nil	Nil	2-3	1-2	Nil	Nil	N	Nil	Nil	plenty	3-5	Nil	Nil	N
7	I17346	37/M	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	N
8	H68985	32/M	Nil	Nil	1-2	2-4	Nil	Nil	N	Nil	Nil	6-7	2-3	Nil	Nil	N
9	I47697	52/M	Nil	Nil	4-5	10-12	Nil	Nil	N	Nil	Nil	4-5	4-5	Nil	Nil	N
10	I32545	56/F	Nil	Nil	1-2	1-3	Nil	Nil	N	Nil	Nil	1-2	2-3	Nil	Nil	N
11	I41220	28/M	Nil	Nil	3-5	4-6	Nil	Nil	N	Nil	Nil	3-5	1-2	Nil	Nil	N
12	I76332	48/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	N
13	F015989	58/M	Nil	Nil	3-5	3-5	Nil	Nil	N	Nil	Nil	1-2	2-3	Nil	Nil	N
14	H73783	26/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	2-3	2-3	Nil	Nil	N
15	I50768	33/M	Nil	Nil	2-3	3-5	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	N
16	I56310	29/M	Nil	Nil	2-3	2-3	Nil	Nil	N	Nil	Nil	3-5	3-5	Nil	Nil	N
17	I26784	39/M	Nil	Nil	2-4	2-4	Nil	Nil	N	Nil	Nil	3-5	1-2	Nil	Nil	N
18	I01756	60/M	Nil	Nil	2-3	2-3	Nil	Nil	N	Nil	Nil	2-4	1-2	Nil	Nil	N
19	I55334	26/M	Nil	Nil	1-2	4-5	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	N
20	I55616	44/M	Nil	Nil	1-2	2-3	Nil	Nil	N	Nil	Nil	2-4	1-2	Nil	Nil	N

URINE ANALYSIS BEFORE AND AFTER TREATMENT																
SL. NO	OPD NO	AGE/ SEX	BEFORE TREATMENT							AFTER TREATMENT						
			Alb	Sug	Deposit		BS	BP	Uro	Alb	Sug	Deposit		BS	BP	Uro
					Pus Cell	Epi cell						Pus Cell	Epi cell			
21	I61203	34/M	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
22	I61285	45/M	Nil	Nil	2-4	1-2	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
23	I14652	29/M	Nil	Nil	2-4	2-4	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	*N*
24	I59235	27/F	Nil	Nil	6-7	2-3	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	*N*
25	I25479	20/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	4-5	2-3	Nil	Nil	*N*
26	I45578	30/M	Nil	Nil	3-5	3-5	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	*N*
27	I62094	27/M	Nil	Nil	2-4	2-4	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
28	H44868	42/F	Nil	Nil	1-2	2-3	Nil	Nil	N	Nil	Nil	2-4	1-2	Nil	Nil	*N*
29	I64463	36/F	Nil	Nil	1-2	2-4	Nil	Nil	N	Nil	Nil	2-3	1-2	Nil	Nil	*N*
30	H79813	36/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
31	H70471	26/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	2-4	2-4	Nil	Nil	*N*
32	I38495	32/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	6-8	4-6	Nil	Nil	*N*
33	I66809	29/F	Nil	Nil	loaded	loaded	Nil	Nil	N	Nil	Nil	6-7	2-4	Nil	Nil	*N*
34	I63770	34/F	Nil	Nil	4-5	2-3	Nil	Nil	N	Nil	Nil	3-5	2-4	Nil	Nil	*N*
35	H9394	20/M	Nil	Nil	4-5	2-3	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
36	I44707	37/F	Nil	Nil	plenty	4-5	Nil	Nil	N	Nil	Nil	1-2	1-2	Nil	Nil	*N*
37	I70641	40/F	Nil	Nil	2-4	2-4	Nil	Nil	N	Nil	Nil	1-2	3-5	Nil	Nil	*N*
38	H74488	26/M	Nil	Nil	3-5	1-3	Nil	Nil	N	Nil	Nil	1-2	4-5	Nil	Nil	*N*
39	I73575	43/F	Nil	Nil	2-4	1-2	Nil	Nil	N	Nil	Nil	2-4	1-2	Nil	Nil	*N*
40	I69309	30/F	Nil	Nil	1-2	1-2	Nil	Nil	N	Nil	Nil	3-5	2-4	Nil	Nil	*N*

USG ABDOMEN RESULTS BEFORE AND AFTER TREATMENT								
S. NO	**OPD NO**	**AGE/ SEX**			SIZE OF THE KIDNEY	SITE OF THE CALCULUS	NO OF CALCULUS	SIZE OF THE CALCULUS
1	I24184	30/M	RT KIDNEY	BT	9 .1 × 4.4	Interpole	1	10mm
				AT	9 .5 × 4.5	Interpole	1	10mm
			LT KIDNEY	BT	9 .5 × 4.1	Ureter, Interpole	2	6mm, 9mm
				AT	10 .9 × 4.2	Interpole	1	10mm
2	I39175	54/F	RT KIDNEY	BT	9 .4 × 3.9	Upperpole	1	4.5mm
				AT	10 × 4.2	upperpole	1	3.8mm
			LT KIDNEY	BT	9 .6 × 4.4	----	---	---
				AT	10 .1 × 4.7	lower calyx	1	4.9mm
3	H98065	26/F	RT KIDNEY	BT	10 .1 × 4	upper, mid lower calyx	4	5.7, 3.8, 4.6, 4.5mm
				AT	9 .1 × 4.7	upper, mid, lower calyx	5	4.3, 3.9, 6.1, 4.7, 4.5mm
			LT KIDNEY	BT	9 .8 × 4.1	----	----	----
				AT	10 .1 × 4.8	lower calyx	1	6.1mm
4.	I13626	41/F	RT KIDNEY	BT	10 .4 × 4.5	upper, mid calyx	2	5.4mm, 4.4mm
				AT	9 × 3.9	Upper, lower calyx	2	3.7mm, 3.4mm
			LT KIDNEY	BT	10 .5 × 4.2	----	---	---
				AT	9 .2 × 4.2	----	---	---
5	I27576	38/F	RT KIDNEY	BT	10 .2 × 3.8	Upper calyx	1	4.3mm
				AT	9 .8 × 3.9	---	---	---
			LT KIDNEY	BT	10 .2 × 4.3	----	---	---
				AT	11 .5 × 4.8	mid calyx	1	5.0mm
6	H30190	25/M	RT KIDNEY	BT	9 .5 × 5.3	lower, mid, upper calyx	3	6.4mm, 8.9mm, 4.9mm
				AT	9 .6 × 5.2	mid calyx	1	6.8mm
			LT KIDNEY	BT	11 × 6.1	mid, upper calyx	2	7.3mm, 7.6mm
				AT	9 .7 × 5.1	upper calyx	1	4.9mm

7	I17346	37/M	RT KIDNEY	BT	10.7 × 5.1	---	---	---
				AT	9.4 × 5.3	---	---	---
			LT KIDNEY	BT	11 × 5.8	mid calyx, mid ureter	2	5.4mm, 7.6mm
				AT	9.9 × 5.1	Lowerpole	1	4.9mm
8	H68985	32/M	RT KIDNEY	BT	9.6 × 4.6	lower calyx	1	5.8mm
				AT	9.1 × 4.1	---	0	---
			LT KIDNEY	BT	10.6 × 5	---	---	---
				AT	9.8 × 4.7	---	---	---
9	I47697	52/M	RT KIDNEY	BT	10.8 × 42	Ureter, upper, mid, lower calyx	multiple	largest-6mm
				AT	109.8 × 51.2	upper, middle lower calyx	3	largest-6.6mm
			LT KIDNEY	BT	99 × 42	Lower, mid calyx	multiple	largest 3mm
				AT	108.7 × 53	mid, lower calyx	3	Largest 3.6mm
10	I32545	56/F	RT KIDNEY	BT	10.0 × 49	---	---	---
				AT	10.0 × 49	---	---	---
			LT KIDNEY	BT	9.8 × 4.0	lower calyx	1	4.5mm
				AT	9.8 × 4.0	---	---	---
11	I41220	28/M	RT KIDNEY	BT	9.4 × 4.5	upper & lower calyx	2	5.3mm 4.5mm
				AT	9.1 × 4.6	mid, lowerpole	2	3.5mm 5.6mm
			LT KIDNEY	BT	10 × 4.6	lower calyx, ureter	2	4.5mm 4.5mm
				AT	9.7 × 4.5	upperpole	1	3mm
12	I76332	48/F	RT KIDNEY	BT	10.5 × 3.8	---	---	---
				AT	9.5 × 3.1	---	---	---
			LT KIDNEY	BT	9.5 × 4.6	Vesico ureteric junction	1	4.4mm
				AT	8.9 × 4.5	---	---	---
13	F015989	58/M	RT KIDNEY	BT	10.9 × 4.8	mid & lowerpole	2	4mm, 6mm
				AT	10.7 × 4.7	mid calyx	1	4.9mm
			LT KIDNEY	BT	10.7 × 5.2	---	---	---
				AT	10.3 × 5	---	---	---

14	H73785	26/F	RT KIDNEY	BT	9.1 × 3.7cm	---	---	---
				AT	10 × 4.1cms	---	---	---
			LT KIDNEY	BT	10.2 × 4.3cm	upper & mid calyx	2	3.2 mm 4.6mm
				AT	10.5 × 4.6cm	---	---	---
15	I50768	33/M	RT KIDNEY	BT	10.2 × 4.5	lower midpole	3	Largest 5.6mm
				AT	10.1 × 4.3	midpole	1	5mm
			LT KIDNEY	BT	11.4 × 4.6	midpole	2	3mm, 4mm
				AT	11.3 × 4.2	---	---	---
16	I56310	29/M	RT KIDNEY	BT	10.2 × 4.2	upper & mid calyx	2	3mm, 5mm
				AT	10 × 3.9	---	0	---
			LT KIDNEY	BT	11.1 × 4.5	mid calyx	1	5mm
				AT	10.8 × 4.2	---	0	---
17	I26784	39/M	RT KIDNEY	BT	9.7 × 4.5	lowerpole	1	5.0mm
				AT	10.1 × 5	midpole	1	4.5mm
			LT KIDNEY	BT	10.6 × 5.3	---	---	---
				AT	10.2 × 4.7	---	---	---
18	I01756	60/M	RT KIDNEY	BT	10.2 × 3.2	Interpole	1	2.5mm
				AT	9.8 × 3.9	---	0	---
			LT KIDNEY	BT	10.2 × 4.5	Interpole	1	4.7mm
				AT	10.5 × 4.3	---	0	---
19	I55334	26/M	RT KIDNEY	BT	9.9 × 4.5	renal pelvis	multiple	large-8mm
				AT	9.2 × 4.4	renal pelvis	multiple	large-7.2mm
			LT KIDNEY	BT	11.3 × 4.1	mid pole	multiple	large 6mm
				AT	10.1 × 5.2	mid pole	multiple	large 6.7mm
20	I55616	44/M	RT KIDNEY	BT	10.6 × 4.3	upper pole	1	6mm
				AT	10.2 × 4	---	---	---
			LT KIDNEY	BT	11.1 × 4.5	VUJ, lower pole	2	5mm 4mm
				AT	10.8 × 4.2	---	---	---

S. NO	OPD NO	AGE/ SEX			SIZE OF THE KIDNEY	SITE OF THE CALCULUS	NO OF CALCULUS	SIZE OF THE CALCULUS
21	I61203	34/M	RT KIDNEY	BT	10 .8 × 4.2	upper calyx	1	4mm
				AT	10 .4 × 4	---	---	---
			LT KIDNEY	BT	11 .5 × 4.1	upper & inter polar calyx	2	largest 5.5mm
				AT	10 .9 × 3.8	---	---	---
22	I61285	45/M	RT KIDNEY	BT	10 .9 × 4.7	Lower pole	1	4.2mm
				AT	10.7 × 4.6	---	---	---
			LT KIDNEY	BT	10 .7 × 5.2	mid calyx	1	4.8mm
				AT	10 .3 × 5	---	---	---
23	I14652	29/M	RT KIDNEY	BT	9 .5 × 4.6	mid calyx	2	3.4, 4.6 mm
				AT	11 × 5.3	---	---	---
			LT KIDNEY	BT	11 × 5.2	lower calyx	2	5.7 mm 4.8 mm
				AT	10 .9 × 5.8	ureter mid calyx	2	9.3 mm, 3.8 mm
24	I59235	27/F	RT KIDNEY	BT	9 .8 × 4.7	mid calyx	2	4.2 mm, 2.4 mm
				AT	9.8 × 4.7	---	---	---
			LT KIDNEY	BT	8.5 × 4.5	----	---	---
				AT	8 .5 × 4.4	----	---	---
25	I25479	20/F	RT KIDNEY	BT	8.9 × 4.5	----	3	5 mm
				AT	8 .9 × 4.5	---	3	5 mm
			LT KIDNEY	BT	9 .1 × 5.7	----	2	5 mm
				AT	9 .3 × 5.4	---	2	5mm
26	I45578	30/M	RT KIDNEY	BT	11 .4 × 5.3	mid pole	1	5 mm
				AT	11.3 × 5.0	mid pole	1	4.8mm
			LT KIDNEY	BT	11.9 × 5.9	---	---	---
				AT	11.4 × 5.3	---	---	---
27	I62094	27/M	RT KIDNEY	BT	9.8 × 4.5	---	---	---
				AT	9.4 × 4.2	---	---	---
			LT KIDNEY	BT	10.6 × 5	Inter polar calyx	1	7.1 mm
				AT	10.8 × 4.2	---	---	---

28	H44868	42/F	RT KIDNEY	BT	9.6 × 5.6	---	---	---
				AT	---	---	---	---
			LT KIDNEY	BT	9.8 × 5.9	upper calyx	1	5 mm
				AT	---	upper calyx	1	5 mm
29	I64463	36/F	RT KIDNEY	BT	9.0 × 4.5	mid calyx	2	5 mm, 3.8 mm
				AT	9 × 3.7	---	---	---
			LT KIDNEY	BT	9.9 × 5.2	---	---	---
				AT	9.9 × 5.4	---	---	---
30	H79813	36/F	RT KIDNEY	BT	9.6 × 4.6	upper pole, inter pole	2	6.8 mm, 5.6 mm
				AT	9.5 × 4.5	lower pole	1	4.5 mm
			LT KIDNEY	BT	10.6 × 5	lower pole	1	5 mm
				AT	10.5 × 5	---	---	---
31	H70471	26/F	RT KIDNEY	BT	10.8 × 4.3	mid calyx	1	4.1 mm
				AT	10.3 × 4.4	mid calyx	1	3.4 mm
			LT KIDNEY	BT	10.6 × 4.7	---	---	---
				AT	10.3 × 4.5	---	---	---
32	I38495	32/F	RT KIDNEY	BT	9.5 × 4.5	mid calyx	1	4 mm
				AT	9.2 × 4.2	mid calyx	1	9.4 mm
			LT KIDNEY	BT	9.9 × 5.2	---	---	---
				AT	9.8 × 5.4	---	---	---
33	I66809	29/F	RT KIDNEY	BT	100.4 × 47.2	upper, middle lower calyx	3	4mm, 6mm,5mm
				AT	104.8 × 48.4	mid lower calyx	3	4.5mm,5.3mm, 5.7mm
			LT KIDNEY	BT	102 × 63.8	upper, middle lower calyx	6	4mm, 4mm, 5mm, 7mm,6mm,
				AT	104.3 × 48.3	upper, middle lower calyx	5	Largest 4.7mm
34	I63770	34/F	RT KIDNEY	BT	9 × 4.7cm	lower pole	1	4 mm
				AT	9 × 3.7cms	---	---	--
			LT KIDNEY	BT	10.3 × 5.4cm	lower pole, inter pole	2	10 mm 4mm
				AT	9.9 × 5.2cm	---	0	———

35	H9394	20/M	RT KIDNEY	BT	10.8 × 5.9	---	Few	5.6mm
				AT	8.5 × 4.6	---	---	---
			LT KIDNEY	BT	10.6 × 6.2	---	Few	4-6mm
				AT	10.3 × 4.6	---	---	---
36	I44707	37/F	RT KIDNEY	BT	10.2 × 5.2	mid lower pole	2	6mm, 7mm
				AT	10 × 4.2	mid lower pole	2	7.5 mm, 3.5 mm
			LT KIDNEY	BT	10.4 × 4.6	upper lower pole	2	3.4 mm 4 mm
				AT	10.3 × 4.4	upper, lower pole	2	4.5 mm, 4 mm
37	I70641	40/F	RT KIDNEY	BT	10.3 × 5.3	---	---	---
				AT	10 × 5.1	---	---	---
			LT KIDNEY	BT	10.5 × 4.8	lower pole	1	8 mm
				AT	10.3 × 4.2	lower pole	1	4mm
38	H74488	26/M	RT KIDNEY	BT	10.3 × 4.6	lower upper pole calyx	2	7.4 mm, 7 mm
				AT	10.8 × 4.6	mid lower calyx	2	5.3 mm, 4.5 mm
			LT KIDNEY	BT	11.6 × 5.7	---	---	---
				AT	11.4 × 5	---	---	---
39	I7357	43/F	RT KIDNEY	BT	10.7 × 5.8	upper calyx	1	5 mm
				AT	9.5 × 4.6	---	---	---
			LT KIDNEY	BT	11.5 × 6.2	---	---	---
				AT	10.2 × 4.5	---	---	---
40	I69309	30/F	RT KIDNEY	BT	10.47 × 4.21	upper calyx	multiple	largest 5.3 mm
				AT	10.2 × 4.7	---	---	---
			LT KIDNEY	BT	10.49 × 4.83	VUJ, lower pole	1	4.4mm
				AT	10.1 × 4.9	---	---	---

BT-Before Treatment, AT- After Treatment, RT- Right Kidney, LT- Left Kidney

BIOCHEMICAL ANALYSIS OF SAARA PARPAM

Preparation of extract:

10g of Saara Parpam is measured accurately and placed in a 250 ml of clean beaker and added with 50ml of distilled water. Then it is boiled well for about 10 minutes. Then it is cooled and filtered in a 100ml volumetric flask and made up to 100ml with distilled water.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	Appearance of the sample	Straw color	
I.	Test For Acid Radicles		
1.	**Test for Sulphate:** 2 ml of the above prepared extract is taken in a test tube to this added 2ml of 4% ammonium oxalate solution.	No cloudy appearance.	Absence of Sulphate.
2.	**Test for Chloride:** 2 ml of the above prepared extract is added with dil. Hno_3 till the effervescence ceases. Then 2 ml of silver nitrate solution is added.	Cloudy appearance present.	**Presence of Chloride.**
3.	**Test for Phosphate:** 2ml of the extract is treated with 2ml of ammonium molybdate solution and 2ml of con.Hno_3.	No cloudy yellow appearance.	Absence of Phosphate.
4.	**Test for Carbonate**: 2ml of the extract is treated with 2ml magnesium sulphate solution.	Cloudy appearance present.	**Presence of Carbonate.**
5.	**Test for Nitrate:** 1 drop of the substance is heated with copper turnics and concentrated H_2SO_4 and viewed the test tube vertically down.	No characteristic changes.	Absence of nitrate.
6.	**Test for Sulphide:** 1 ml of the substance is treated with 2 ml of con.HCL.	No rotten egg smelling gas evolved.	Absence of Sulphide.

7.	**Test for Fluride & Oxalate:** 2 ml of the extract is added with 2ml of dil. Acetic acid and 2 ml calcium chloride solution and heated.	No cloudy appearance.	Absence of Fluride and Oxalate.
8.	**Test for Nitrite:** 3 drops of the extract is placed on filter paper on that 2 drops of acetic acid and 2 drops Benzidine solution is placed.	No characteristic changes.	Absence of Nitrite.
9.	**Test for Borate:** 2 pinches of the substance is made into paste by using sulphuric acid and alcohol (95%) and introducer into the blue flame.	Bluish green color flame not appeared.	Absence of Borate.
II.	**Test for Basic Radicles**		
1.	**Test for Lead:** 2 ml of the extract is added with 2 ml of Potassium iodide solution.	No yellow precipitate is obtained.	Absence of Lead.
2.	**Test for Copper:** One pinch of substance is made into paste with con.HCL in a watch glass and introduced into the non- luminous part of the flame.	No blue color flame.	Absence of copper.
3.	**Test for Aluminum:** To the 2ml of the extract sodium hydroxide is added in drops to excess.	No characteristic changes.	Absence of Aluminium.
4.	**Test for Iron:** a. To the 2 ml of extract add 2 ml of ammonium thiocynate solution. b. To the 2ml of extract 2 ml ammonium thiocynate solution and 2 ml of con.HNO_3 is added.	Mild red color appeared. Blood red color appeared.	**Presence of Iron.** **Presence of Iron**.

5.	**Test for Zinc:** To 2ml of the extract sodium hydroxide solution is added in drops to excess.	White precipitate is not appeared.	Absence of Zinc
6.	**Test for Calcium:** 2 ml of the extract is added with 2ml of 4% ammonium oxalate solution.	No Cloudy appearance.	Absence of Calcium.
7.	**Test for Magnesium:** To 2ml of extract sodium hydroxide solution is added in drops to excess.	White precipitate is not appeared.	Absence of Magnesium
8.	**Test for Ammonium**: To 2 ml of extract few ml of Nessler's reagent and excess of sodium hydroxide solution are added.	Brown color appeared.	Presence of Ammonium
9.	**Test for Potassium:** 1 ml of substance is treated with 2ml of sodium nitrate solution and then treated with 2ml of cobalt nitrate in 30% glacial acetic acid.	No yellowish precipitate is obtained.	Absence of Potassium.
10.	**Test for Sodium:** 2 pinches of the substance is made into paste by using HCL and introduced into the blue flame of Bunsen burner.	No yellow color flame appeared.	Absence of sodium.
11.	**Test for Mercury:** 2 ml of the extract is treated with 2 ml of sodium hydroxide solution.	No yellow precipitate is appeared.	Absence of mercury.
12.	**Test for Arsenic:** 2 ml of the extract is treated with 2 ml of sodium hydroxide solution.	No brownish red precipitate is obtained.	Absence of Arsenic.

III.	**Miscellanious**		
1.	**Test for Starch:** 2ml of the extract is treated with weak iodine solution.	No blue color developed.	Absence of starch.
2.	**Test for Reducing sugar:** 5 ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for two minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes. The color changes are noted.	No brick red color developed.	Absence of Reducing sugar.
3.	**Test for the Alkaloids:** 2 ml of extract is treated with 2 ml of picric acid.	Yellow colour developed.	**Presence of Alkaloid.**
4.	**Test for Tannic acid:** 2 ml of extract is treated with 2 ml of ferric chloride solution.	Black color precipitate is not appeared.	Absence of Tannic acid.
5.	**Test for Unsaturated compound:** To the 2 ml of extract 2 ml of Potassium permanganate solution is added.	Potassium permanganate is not decolorized.	Absence of Unsaturated compound.
6.	**Test for Amino acid:** 2 drops of the extract is placed on a filter paper and dried well.	No violet color developed.	Absence of amino acid.
7.	**Test for Type of Compound:** 2 ml of the extract is treated 2 ml of ferric chloride solution.	No green color developed. No red color developed. No violet color developed.	Absence of oxyquinole epinephrine and pyro catechol. Anti pyrine, Aliphatic amino acids and meconic acid are absent. Apomorphine salicylate and Resorcinol are

		No blue color developed.	absent. Morphine, Phenol cresol and hydro quinine are absent.

Result:

The chemical study of the trial drug reveals **Carbonate, Iron, Chloride, Ammonium and Alkaloid**

RESULTS OF BIOCHEMICAL ANALYSIS

ANALYTICAL TEST	INFERENCE
Sulphate	Absence of Sulphate
Chloride	**Presence of Chloride**
Phosphate	Absence of Phosphate
Carbonate	**Presence of Carbonate**
Fluoride &Oxalate	Absence of fluoride and oxalate
Nitrate	Absence of Nitrate
Sulphide	Absence of Sulphide
Nitrite	Absence of Nitrite
Borate	Absence of Borate
Lead	Absence of Lead
Copper	Absence of Copper
Aluminium	Absence of Aluminium
Iron	**Presence of Iron**
Zinc	Absence of Zinc
Calcium	Absence of Calcium
Magnesium	Absence of Magnesium
Ammonium	**Presence of Ammonium**
Pottasium	Absence of Potassium
Sodium	Absence of Sodium

PHYSICOCHEMICAL EVALUATION

Project ID	:	NRS/AS/0027/02/2017
Institute	:	National Institute of siddha ,Chennai
Sample Name	:	Chara Parpam
Sample ID	:	CP

Percentage Loss on Drying

10gm of test drug was accurately weighed in evaporating dish .The sample was dried at 105^{o}C for 5 hours and then weighed.

Percentage loss in drying = Loss of weight of sample/ Wt of the sample X 100

Determination of Total Ash

3 g of test drug was accurately weighed in silica dish and incinerated at the furnace a temperature 400 ºC until it turns white in color which indicates absence of carbon. Percentage of total ash will be calculated with reference to the weight of air-dried drug.

Total Ash = Weight of Ash/Wt of the Crude drug taken X 100

Determination of Acid Insoluble Ash

The ash obtained by total ash test will be boiled with 25 ml of dilute hydrochloric acid for 6mins. Then the insoluble matter is collected in crucible and will be washed with hot water and ignited to constant weight. Percentage of acid insoluble ash will be calculated with reference to the weight of air-dried ash.

Acid insoluble Ash = Weight of Ash/Wt of the Crude drug taken X 100

Determination of Water Soluble Ash

The ash obtained by total ash test will be boiled with 25 ml of water for 5 mins. The insoluble matter is collected in crucible and will be washed with hot water, and ignite for 15mins at a temperature not exceeding 450ºC. Weight of the insoluble matter will be subtracted from the weight of the ash; the difference in weight represents the water soluble ash. Calculate the percentage of water-soluble ash with reference to the air-dried drug.

Water Soluble Ash = Weight of Ash/Wt of the Crude drug taken X 100

Determination of pH

About 5 g of test sample will be dispersed in 25ml of distilled water and filtered the resultant solution is allowed to stand for 30 mins and the subjected to pH evaluation

Final Test report

Parameter	**Observation**
Color	Milky White
Smell	Agreeable
Touch	Powder
Appearance	Fine Powder consistency

S.No	**Parameter**	**Mean (n=3) SD**
1.	***Loss on Drying at 105 ℃ (%)***	10.87 ± 3.36
2.	***Total Ash (%)***	9.22 ± 1.34
3.	***Acid insoluble Ash (%)***	12.87 ± 4.02
4.	***Water Soluble Ash (%)***	0.74 ± 0.10
5.	***PH***	7

Reference:

1. India Pharmacopeia I Volume I, Government of India, Ministry of Health and Family welfare, Indian Pharmacopeia commission, 2014.

2. Pharmacopoeial Laboratory for Indian Medicine (PLIM) Guideline for standardization and evaluation of indian medicine which include drugs of Ayurveda, Unani and Siddha systems. Department AYUSH .Ministry of Health & Family Welfare, Govt. of India

GCMS- Analysis Report

GCMS (Clarus 500 Perkin – elmer (Auto system XL)), NIST Ver.2.1 MS data library

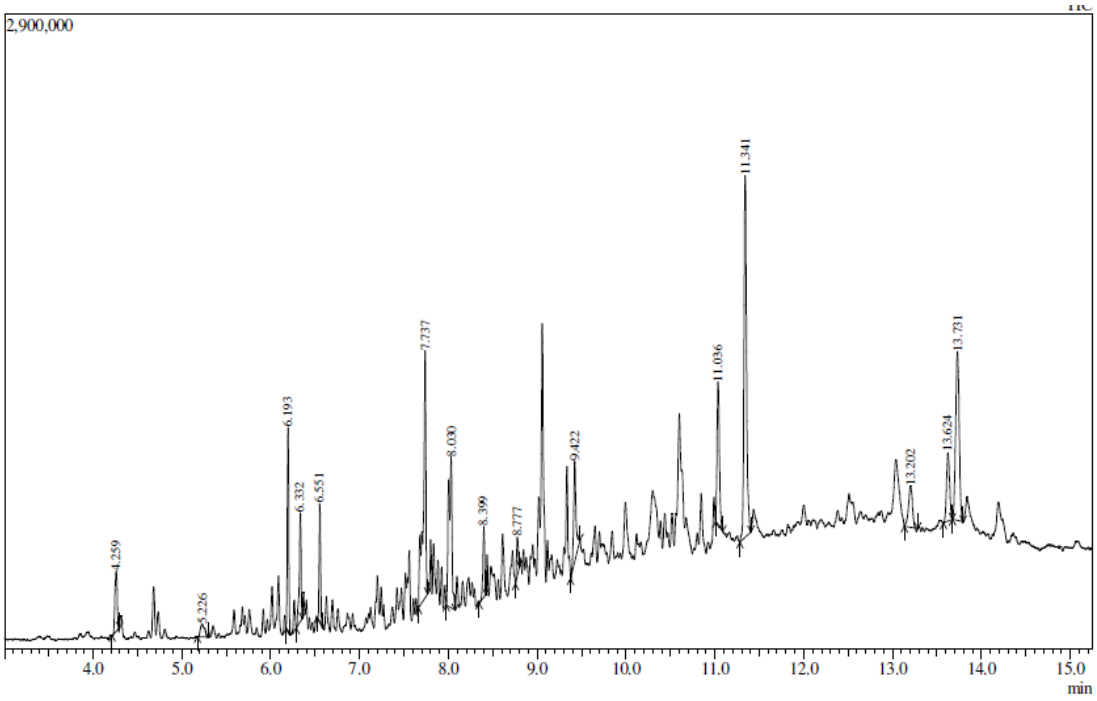
Specification :

Start Time(min)	End Time(min)	Start m/z	End m/z Scan	Speed
2.50	18.00	50.00	650.00	2000

Sample Inlet Unit : GC

GC-MS Plays a key role in the analysis of unknown components of plant origin. GC-MS ionizes compound and measures their mass numbers. Ionization method includes EI (Electron Ionization). The EI method produces ions by colliding thermal electrons emitted from a filament with sample gas molecules. This method provides high stability in ionization and obtained mass spectra show good reproducibility. The EI method provides good result for quantitative analysis as well. Quantitative analysis with GC-MS, in which only ions specific to the compounds are measured, is highly selective method without interfering components. Gas chromatography Technique involves the separation of volatile components in a test sample using suitable capillary column coated with polar or non-polar or intermediate polar chemicals. Elite-1 column (100% Dimethyl polysiloxane) is a non-polar column used for analysis of phyto-components. Elite -5 column (5% phenyl and 95% methyl polysiloxane) is an intermediate column and also used for the estimation of Phytochemical. An inert gas such as hydrogen or nitrogen or helium is used as a carrier gas .The compounds of test sample is evaporated in the injection port of the GC equipment and segregated in the column by absorption and adsorption technique with suitable GC programme.

GC-MS CHROMATOGRAM OF CP



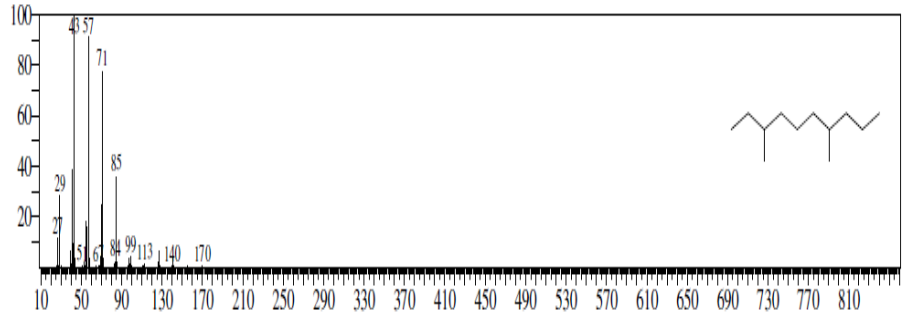
Peak Report of CP

Peak#	R.Time	Area	Area%	Height	Height%
1	4.259	496877	3.02	273728	3.16
2	5.226	189941	1.16	57911	0.67
3	6.193	1067898	6.49	932010	10.77
4	6.332	707356	4.30	495708	5.73
5	6.551	596880	3.63	540492	6.25
6	7.737	2307881	14.03	1129876	13.06
7	8.030	1757376	10.69	691846	8.00
8	8.399	426761	2.60	320986	3.71
9	8.777	226258	1.38	174455	2.02
10	9.422	868193	5.28	457492	5.29
11	11.036	1145468	6.97	652845	7.55
12	11.341	3231025	19.65	1652505	19.10
13	13.202	553136	3.36	188111	2.17
14	13.624	751162	4.57	311957	3.61
15	13.731	2118296	12.88	771489	8.92
		16444508	100.00	8651411	100.00

\

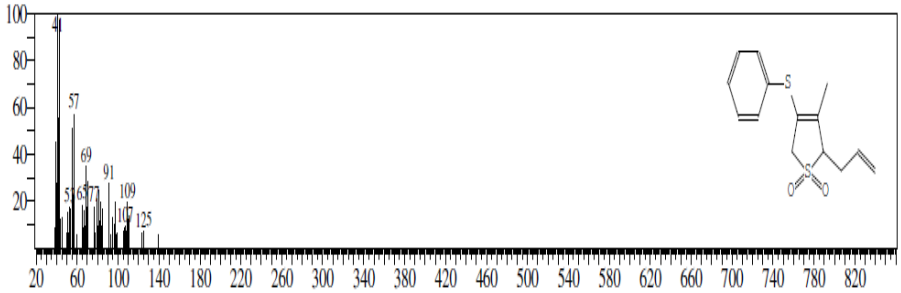
PEAK 1

Hit#:1 Entry:24970 Library:NIST05.LIB
SI:92 Formula:C12H26 CAS:17312-54-8 MolWeight:170 RetIndex:1086
CompName:Decane, 3,7-dimethyl- $$ 3,7-Dimethyldecane # $$



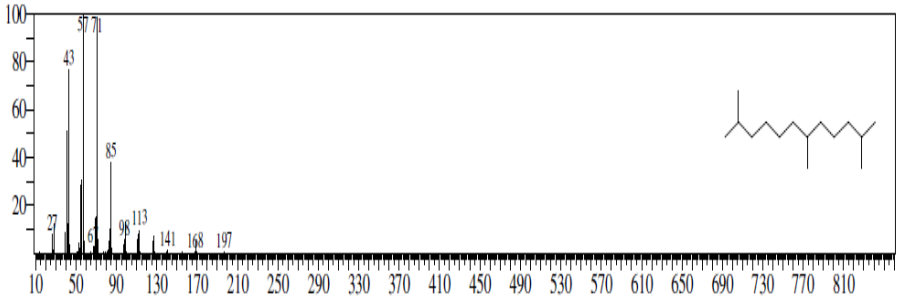
PEAK 2

Hit#:1 Entry:88908 Library:NIST05.LIB
SI:77 Formula:C14H16O2S2 CAS:0-00-0 MolWeight:280 RetIndex:0
CompName:3-Methyl-4-(phenylthio)-2-prop-2-enyl-2,5-dihydrothiophene 1,1-dioxide



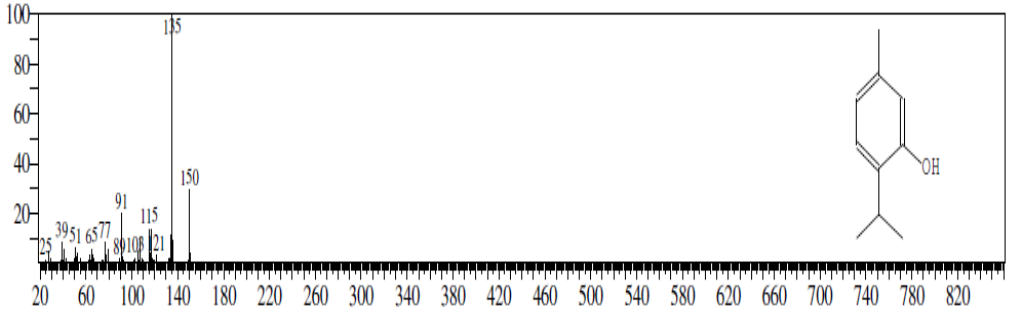
PEAK 3

Hit#:1 Entry:17700 Library:NIST05s.LIB
SI:93 Formula:C15H32 CAS:31295-56-4 MolWeight:212 RetIndex:1320
CompName:Dodecane, 2,6,11-trimethyl- $$ 2,6,11-Trimethyldodecane $$



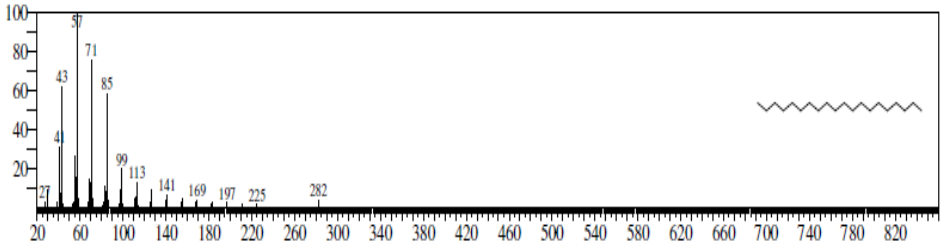
PEAK 4

Hit#:2 Entry:8545 Library:NIST05s.LIB
SI:81 Formula:C10H14O CAS:89-83-8 MolWeight:150 RetIndex:1262
CompName:Thymol $$ Phenol, 5-methyl-2-(1-methylethyl)- $$ p-Cymen-3-ol $$ Thyme camphor $$ 2-Isopropyl-5-methylphenol $$ 3-Hydroxy-p-cymene $



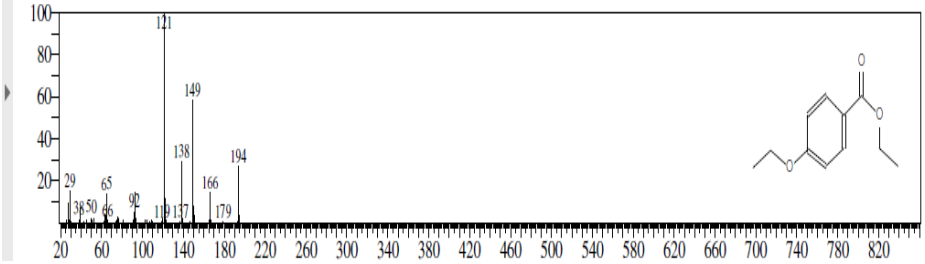
PEAK 5

Hit#:1 Entry:22890 Library:NIST05s.LIB
SI:90 Formula:C20H42 CAS:112-95-8 MolWeight:282 RetIndex:2009
CompName:Eicosane $$ n-Eicosane $$ Icosane # $$



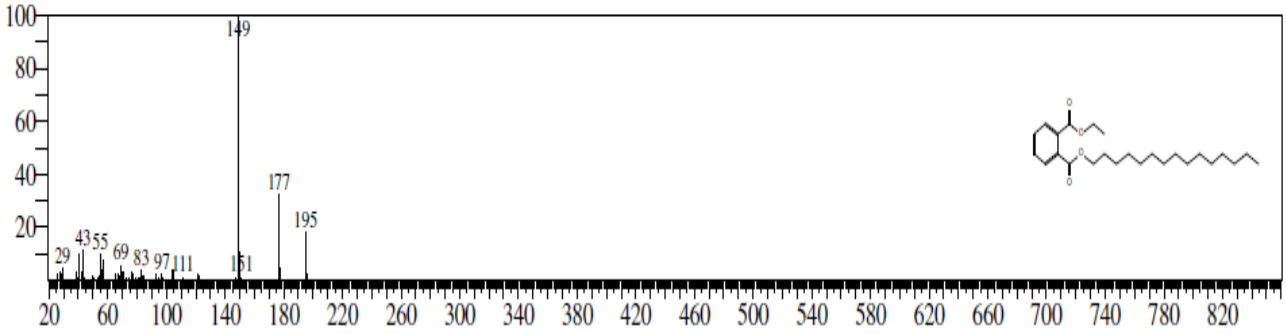
PEAK 6

Hit#:1 Entry:37529 Library:NIST05.LIB
SI:82 Formula:C11H14O3 CAS:23676-09-7 MolWeight:194 RetIndex:1448
CompName:Benzoic acid, 4-ethoxy-, ethyl ester $$ Benzoic acid, p-ethoxy-, ethyl ester $$ Ethyl 4-ethoxybenzoate $$ Ethyl para-ethoxybenzoate $$ Ethyl p-



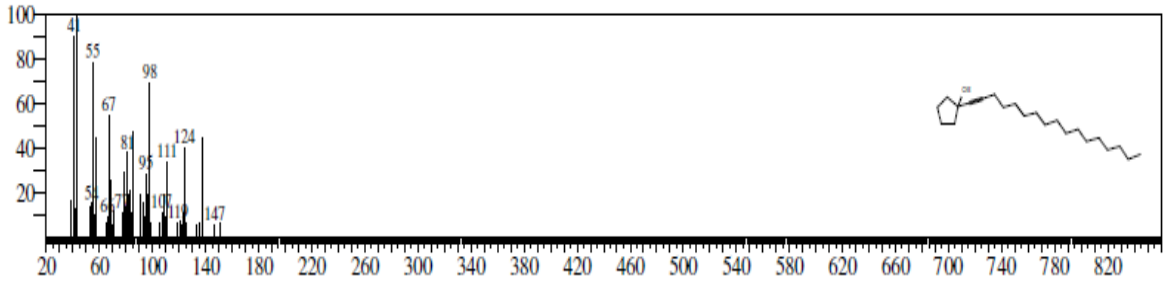
PEAK 7

Hit#:1 Entry:145754 Library:NIST05.LIB
SI:79 Formula:C25H40O4 CAS:0-00-0 MolWeight:404 RetIndex:2931
CompName:Phthalic acid, ethyl pentadecyl ester



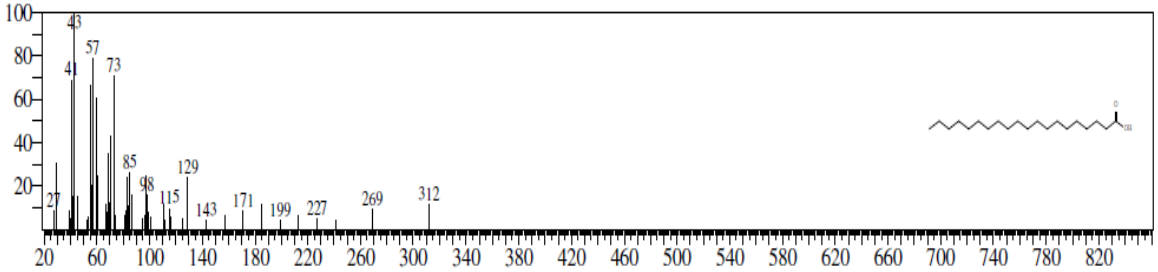
PEAK 8

Hit#:1 Entry:112524 Library:NIST05.LIB
SI:79 Formula:C22H40O CAS:0-00-0 MolWeight:320 RetIndex:2419
CompName:1-Heptadec-1-ynyl-cyclopentanol



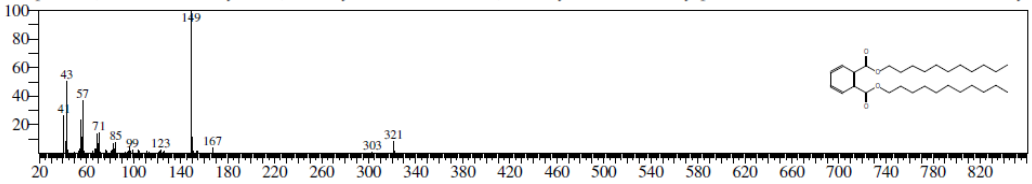
PEAK 9

Hit#:1 Entry:108054 Library:NIST05.LIB
SI:87 Formula:C20H40O2 CAS:506-30-9 MolWeight:312 RetIndex:2366
CompName:Eicosanoic acid $$ Arachic acid $$ Arachidic acid $$ Icosanoic acid $$ n-Eicosanoic acid $$ Arachidic acid (synthetic) $$



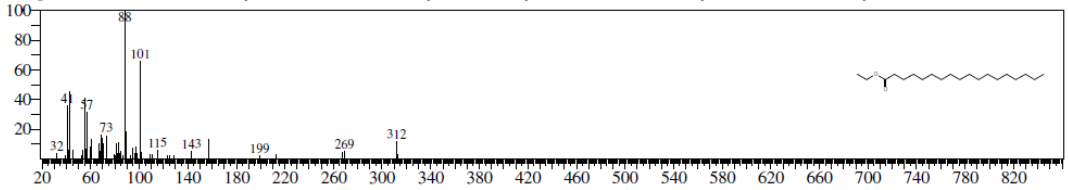
PEAK 10

Hit#:2 Entry:27198 Library:NIST05s.LIB
SI:81 Formula:C30H50O4 CAS:3648-20-2 MolWeight:474 RetIndex:3428
CompName:1,2-Benzenedicarboxylic acid, diundecyl ester $$ Phthalic acid, diundecyl ester $$ Diundecyl phthalate $$ DUP $$ Santicizer 711 $$ Diundecyl



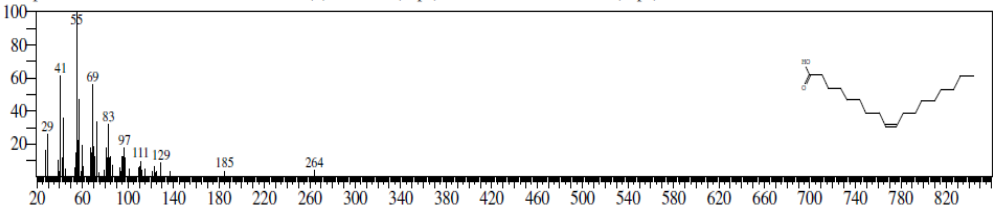
PEAK 11

Hit#:3 Entry:24295 Library:NIST05s.LIB
SI:89 Formula:C20H40O2 CAS:111-61-5 MolWeight:312 RetIndex:2177
CompName:Octadecanoic acid, ethyl ester $$ Stearic acid, ethyl ester $$ Ethyl n-octadecanoate $$ Ethyl octadecanoate $$ Ethyl stearate $$ Radia 7185 $$



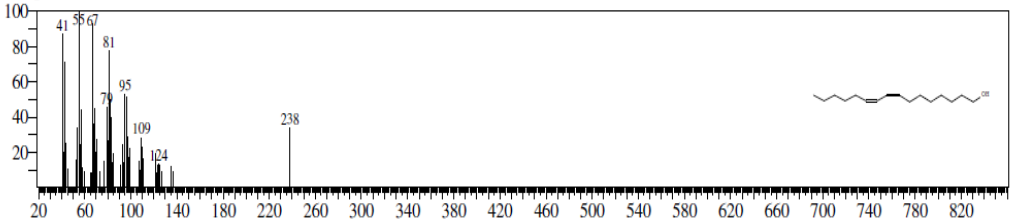
PEAK 12

Hit#:4 Entry:22870 Library:NIST05s.LIB
SI:74 Formula:C18H34O2 CAS:112-80-1 MolWeight:282 RetIndex:2175
CompName:Oleic Acid $$ 9-Octadecenoic acid (Z)- $$ .delta.(Sup9)-cis-Oleic acid $$ cis-.delta.(Sup9)-Octadecenoic acid $$ cis-Oleic Acid $$ cis-9-Octad

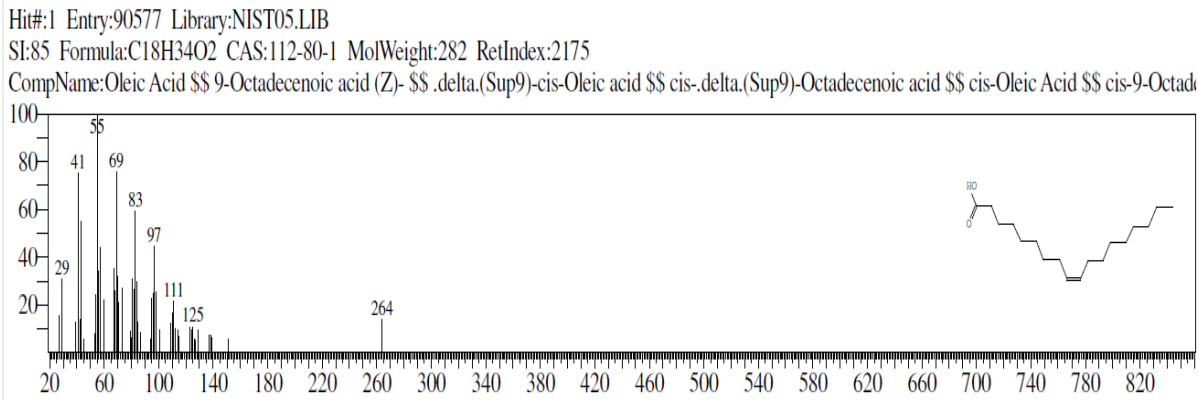


PEAK 13

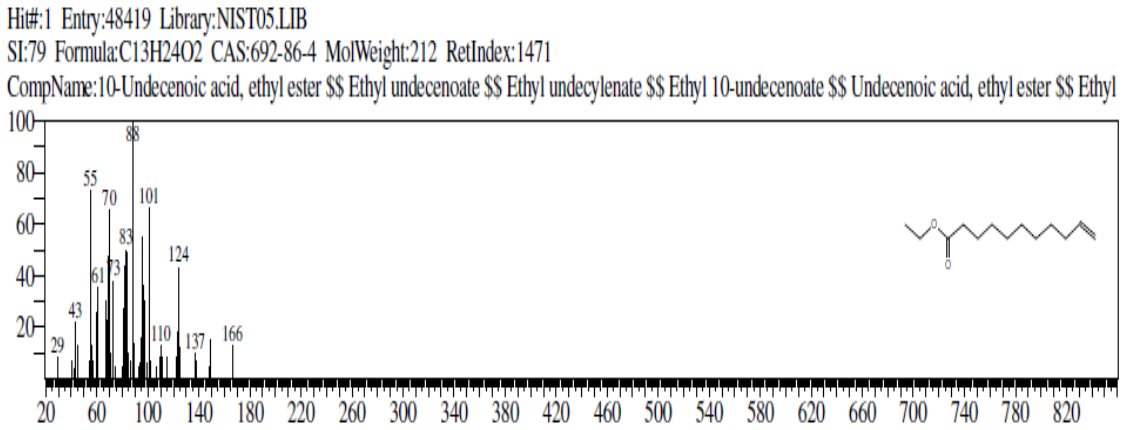
Hit#:2 Entry:64129 Library:NIST05.LIB
SI:87 Formula:C16H30O CAS:0-00-0 MolWeight:238 RetIndex:1870
CompName:Z,Z-8,10-Hexadecadien-1-ol



PEAK 14



PEAK 15



Sample Preparation

Chara Parpam (CP) was dissolved in DMSO and the extract was subjected to the following analysis

Test for Alkaloid- Mayer's reagent

To the test drug about 2ml of Mayer's reagent was added and was observed for the presence of alkaloids. Appearance of dull white precipitate indicates the presence of alkaloids.

Test for flavonoid

To 0.1ml of the test sample about 5 ml of dilute ammonia solution were been added followed by addition of few drops of conc. Sulfuric acid. Appearance of yellow color indicates the presence of Flavonoids.

Test for Glycosides -Borntrager's Test

Test drug is hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 ml of filtered hydrolysate, 3 ml of choloroform is added and shaken, choloroform layer is separated and 10% ammomia solution is added to it. Pink colour indicates presence of glycosides.

Test for Triterepnoids

To the test solution 2ml chloroform was added with few drops of conc. Sulphuric acid (3ml) at the side of the test tube. An interface with a reddish brown coloration is formed if terpenoids constituent is present.

Test for Steroids - Salkowski test

To the test solution 2ml of chloroform was added with few drops of conc. Sulphuric acid (3ml), and shaken well. The upper layer in the test tube was turns into red and sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.

Test for Carbohydrates - Benedict's test

To 0.5 ml of test drug about 0.5 ml of Benedic's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic coloured precipitate indicates the presence of sugar.

Test – Phenol- Lead acetate test

The test sample is dissolved in of distilled water and to this 3 ml of 10% lead acetate solution is added. A bulky white precipitate indicates the presence of phenolic compounds.

Test for tannins

About 0.5ml of test sample is boiled in 20 mL of distilled water in a test tube and then filtered. The filtration method used here is the normal method, which includes a conical flask and filter paper. The 0.1% FeCl3 is added to the filtered samples and observed for brownish green or a blue black coloration, which shows the presence of tannins

Test for Saponins

The test drugs were shaken with water vigorously for 10 mins , copious lather formation indicates the presence of saponins.

Test for Proteins (Biuret Test)

Biuret test: Equal volume of 5% solution of sodium hydroxide and 1% copper sulphate were added. Appearance of pink or purple colour indicates the presence of proteins and free amino acids.

Test of Coumarins

1 ml of extract, 1 ml of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow color.

Test for Quinones

The test samples were treated separately with Alc. KOH solution. Appearance of colors ranging from red to blue indicates the presence of Quinones.

Test for Anthocyanin

About 0.2 ml of the extract was weighed in separate test tube, 1ml of 2N Sodium hydroxide was added, and heated for 5 minutes at 100 ± 2°C. Observed for the formation of bluish green color which indicates the presence of anthocyanin.

Test for Betacyanin

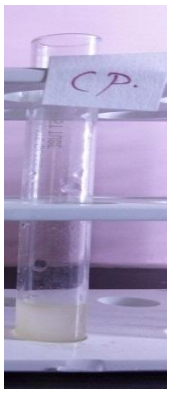
To 2 ml of the test sample, 1 ml of 2N sodium hydroxide was added andheated for 5 min at 100□ C. Formation of yellow colour indicates the presence of betacyanin.

Reference

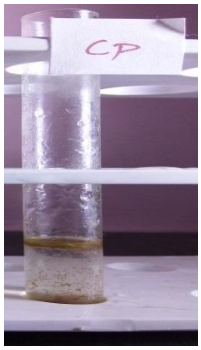
Brain KR, Turner TD. The Practical Evaluation of Phytopharmaceuticals. Bristol:Wright- Scientechnica; 1975:36-45

RESULTS

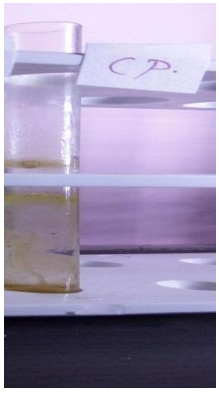
Test for Alkaloid- Mayer's reagent



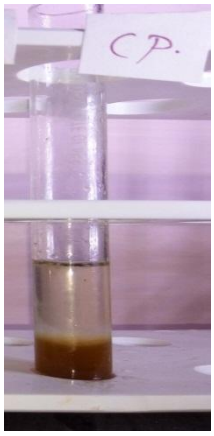
Test for flavonoid



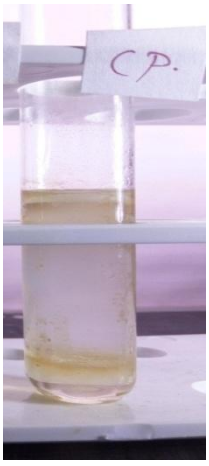
Test for Glycosides -Borntrager's Test



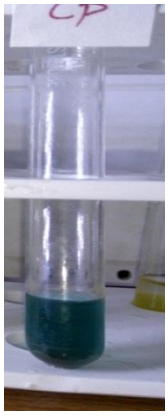
Test for Triterepnoids



Test for Steroids - Salkowski test

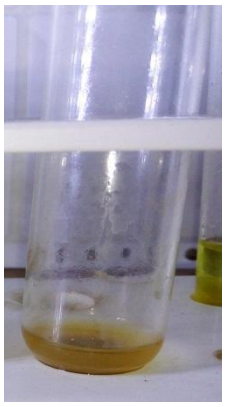


Test for Carbohydrates - Benedict's test

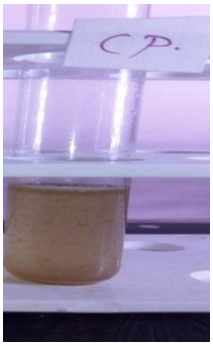


Test – Phenol- Lead acetate test

Test for tannins

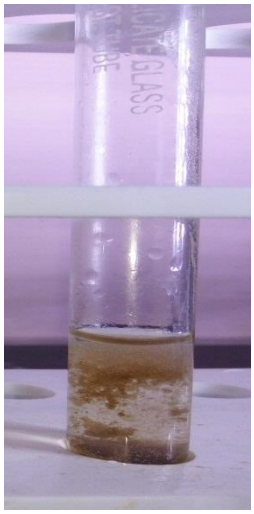


Test for Saponins

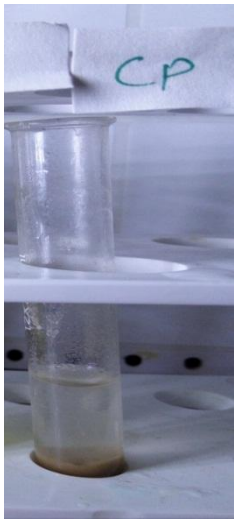


Test for Proteins (Biuret Test)

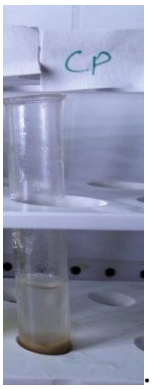
Test of Coumarins



Test for Quinones



Test for Anthocyanin **Test for Betacyanin**

. 

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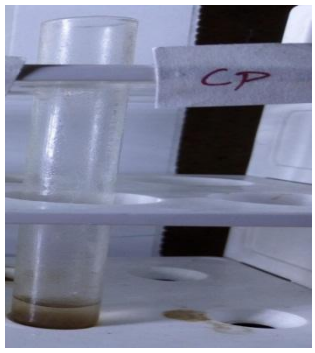


PHYTOCOMPONENTS	CP
ALKALOIDS	+
FLAVONOIDS	-
GLYCOSIDES	-
STEROIDS	-
SUGAR	-
TRITEREPNOIDS	-
COUMARINS	-
PHENOLS	+
TANNINS	-
SAPONINS	-
PROTEINS	+
ANTHOCYANIN	-
BETACYANIN	-
QUINONES	-

+ Indicates positive

- Indicates Negative

Quantitative estimation of phytoconstituents of Chara Parpam

Determination of total Phenol content

The total phenol content was determined using Folin–Ciocalteu reagents with analytical grade Gallic acid as the standard. 1 ml of CP extract sample was added to deionized water (10 ml) and Folin–Ciocalteu phenol reagents (1ml). After 5 minutes, 20% sodium carbonate (2 ml) was added to the mixture. After being kept in total darkness for 1 hr, the absorbance was measured at 750 nm using a spectrophotometer. Amounts of

total Phenol was calculated using Gallic acid calibration curve. The results were expressed as Gallic acid equivalents (GAE) mg/g of dry plant matter.

Reference

Ganesh N. Sharma K, Nitin S, Jyotsana S. Phytochemical screening and estimation of Total Phenolic Content in *Aegle marmelos* Seeds. *Int J Pharma Clinc Res*.2011; 3(2): 27-29.

Estimation of Alkaloid

About 5 gm of CP was weighed into a 250 ml beaker and 200 ml of 10% acetic acid in ethanol was added and covered and allowed to stand for 4 hr. This was filtered and the extract was concentrated on a water bath to one-quarter of the original volume. Concentrated ammonium hydroxide was added drop wise to the extract until the precipitation was complete. The whole solution was allowed to settle and the precipitated was collected and washed with dilute ammonium hydroxide and then filtered. The residue is the alkaloid, which was dried and weighed.

Reference

Ganga rao B, Umamaheswara rao, Sambasiva rao, Mallikarjuna rao T. Studies on phyto chemical constituents, quantification of total phenol, alkaloid content and *In-vitro* anti-oxidant activity of *Coccinia cordifolia*.*Int. J. pharm. life sci.*2011; 2(10):1177-1182.

Phyto- constituents	**CP**
Total phenols (GAE mg/gm)	**0.25 ± 0.03**
Total alkaloids (mg/gm)	**1.27 ± 0.45**

Mean with 3 replicates ± SD.

TLC Analysis Report

Project ID	:	NRS/AS/0028/02/2017
Institute	:	National Institute of Siddha
Sample Name	:	Chara Parpam
Sample ID	:	CP

TLC Analysis

Test sample CP was subjected to thin layer chromatography (TLC) as per conventional one dimensional ascending method using silica gel 60F254, 7X6 cm (Merck) were cut with ordinary household scissors. Plate markings were made with soft pencil. Micro pipette were used to spot the sample for TLC applied sample volume 10-micro liter by using pipette at distance of 1 cm at 5 tracks. In the twin trough chamber with different solvent system Ethyl acetate: Methanol: Water (100:13.5:10) After the run plates are dried and was observed using visible lightShort-wave UV light 254nm and light long-wave UV light 365 nm

Sample Spotting

Visible

Short UV

Long UV

Reference

Lukasz Komsta, Monika Waksmundzka-Hajnos, Joseph Sherma .Thin Layer Chromatography in Drug Analysis .CRC Press, Taylor and Francis.

High Performance Thin Layer Chromatography Analysis

HPTLC method is a modern sophisticated and automated separation technique derived from TLC. Pre-coated HPTLC graded plates and auto sampler was used to achieve precision, sensitive, significant separation both qualitatively and quantitatively. High performance thin layer chromatography (HPTLC) is a valuable quality assessment tool for the evaluation of botanical materials efficiently and cost effectively. HPTLC method offers high degree of selectivity, sensitivity and rapidity combined with single-step sample preparation. In addition it is a reliable method for the quantitation of nano grams level of samples. Thus this method can be conveniently adopted for routine quality control analysis. It provides chromatographic fingerprint of phytochemicals which is suitable for confirming the identity and purity of medicinal plant raw materials.

Chromatogram Development

It was carried out in CAMAG Twin Trough chambers. Sample elution was carried out according to the adsorption capability of the component to be analysed. After elution, plates were taken out of the chamber and dried.

Scanning

Plates were scanned under UV at 366nm. The data obtained from scanning were brought into integration through CAMAG software. Chromatographic finger print was developed for the detection of phytoconstituents present in each extract and Rf values were tabulated.

Reference

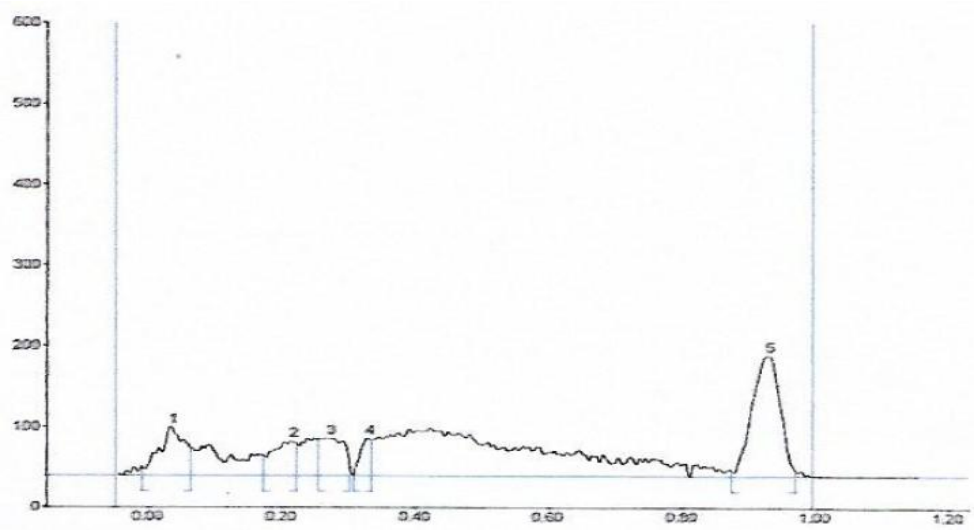
1. Wagner H. Plant Drug Analysis. A thin Layer chromatography Atlas.2nd ed. Heidelberg: Springer-Verlag Belgium; 2002:305, 227.

HPTLC Chromatographic condition

Sample	:	CP
Derivatization Solvent	:	Anisaldehyde
Stationary phase	:	Silica gel GF_{254}
Mobile phase	:	Hexane: Diethyl Ether: Methanol :Acetic acid(4:4:2:1)
Scanning wavelength	:	200-400 nm
Sample concentration	:	10mg/ml
Applied volume	:	5 µl
Application mode	:	CAMAG HPTLC

TLC CHROMATOGRAM OF CP

HPTLC CHROMATOGRAM OF CP



Peak Table of HPTLC finger printing of CP

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %
1	-0.01	6.8	0.03	59.9	17.34	0.07	32.3	1715.2	18.16
2	0.18	21.8	0.21	43.2	12.51	0.22	36.1	1158.7	12.27
3	0.26	45.0	0.27	46.6	13.50	0.30	0.9	1204.1	12.75
4	0.31	9.8	0.33	46.2	13.38	0.34	44.4	629.2	6.66
5	0.88	3.9	0.93	149.4	43.27	0.97	4.3	4737.2	50.16

Evaluationof Anti-urolithiasis activity using Struvite Crystal growth inhibition Assay

Project Id: NRS/AS/0028/02/2017

Sample ID	:	CP
Institute	:	National Institute of Siddha, Chennai.
Purpose	:	Struvite Crystal growth inhibition Assay
Sample Description	:	Siddha Formulation

PROJECT REPORT

Objective

The single diffusion gel growth technique was adopted to evaluate anti-urolithiatic potential of the study drug *Chara Parpam*

Test Drug concentration

Test drug was prepared at two different concentrations of 0.5 and 1 % dispersed in 1.0 M magnesium acetate solution

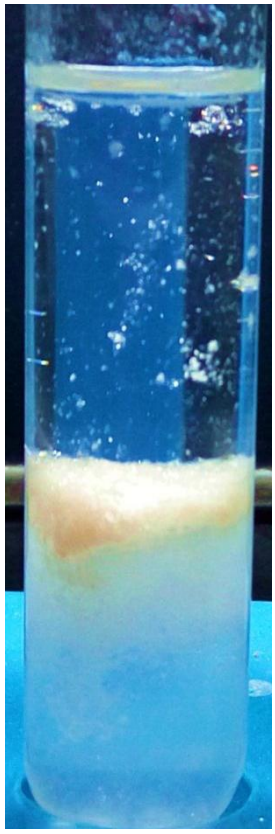
Methodology

An aqueous solution of 0.5M Ammonium dihydrogen phosphate was admixed with the sodium metasilicate solution of specific gravity 1.05 in appropriate amount using

magnetic stirrer so that the pH value 7.0 .pH of the reaction was ensured by using pH probe meter. The gel solution of 10 mL was transferred into the test tubes of 140 mm length and 25 mm diameter. After the gelation took place, 5 mL of supernatant solutions of 0.5 and 1% conc of test drug in 1.0 M magnesium acetate were gently poured on the set gels in test tubes to enumerate the growth inhibition of Struvite crystals. About 5 ml of 1.0 M magnesium acetate without test drug were added as supernatant to control tubes which serves as crystal control group. All the procedures was done in the aseptic medium in laminar flow hood to avoid microbial contaminations. All test tubes and other glassware were autoclaved at 120°C for 15 min. After pouring supernatant solution, the test tubes were capped with airtight stopples. The experiment was conducted at the room temperature. Study on growth of crystal were carried out for five consecutive days.

Growth Pattern of crystal in control and drug added medium

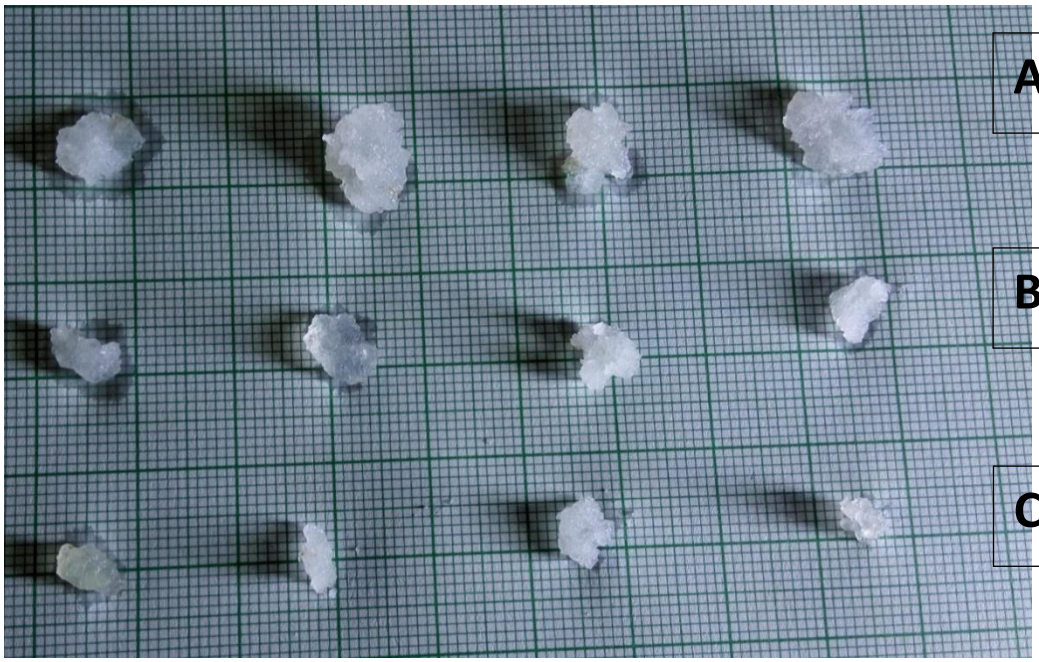
Growth of Struvite crystals in control Gel medium



Growth of Struvite crystals in Gel medium with 0.5% of *Chara Parpam*

Growth of Struvite crystals in Gel medium with 1% of *Chara Parpam*

Size variation of Struvite crystals



A – Size variation of Struvite crystals in Control Gel medium

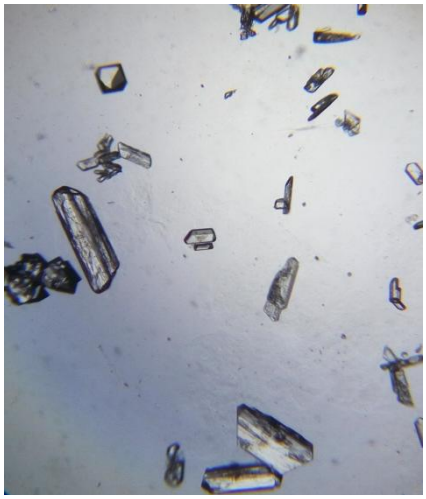
B- Size variation of Struvite crystals in Gel medium with 0.5 % of *Chara Parpam*

C- Size variation of Struvite crystals in Gel medium with 1 % of *Chara Parpam*

Microscopic view of Struvite crystals size after fragmentation.

Control Gel medium

Gel medium with 0.5 % of *Chara Parpam*



Gel medium with 1 % of *Chara Parpam*

Report on Average Length of the Crystal in different medium

S.No	Medium	Average Length of the Crystals in cm
1	**Control Gel medium**	
	Mean	**1.05**
	Std. Deviation	0.264
	Std. Error	0.132
2	**Gel medium + 0.5 % CP**	
	Mean	**0.67**
	Std. Deviation	0.125
	Std. Error	0.062
3	**Gel medium +1% CP**	
	Mean	**0.45**
	Std. Deviation	0.057
	Std. Error	0.028

Observation

Control Medium

Average size of the crystal was higher in the control medium with the Avg length of 1.05 cm

Gel medium + 0.5 % CP

Average size of the crystal was significantly decreased in medium contains 0.5% of test drug CP with the Avg length of 0.67 cm

Gel medium +1% CP

Average size of the crystal was much reduced in medium contains 1 % of test drug CP with the Avg length of 0.45cm

Conclusion

From the result of the study it was concluded that the test drug CP has Promising anti-urolithiasis property in the tested medium.

Reference

Chauhan, C.K., K.C. Joseph, B.B. Parekh and M.J. Joshi, 2008. Growth and characterization of Struvite crystals, Ind. J. Pure Appl. Phys., 46: 507-512

DISCUSSION

The main aim of this study is to evaluate the therapeutic efficacy of the study drug Saaraparpam (internal) in the disease azhalkalladaippu.The clinical features of azhalkalladaippu can be correlated with renal calculus in modern science. As per Yugivathiyachinthamani text, azhalkalladaippu is charecterised by oliguria,urethral pain which mimics the pain caused by the insertion of iron rod in the urethra,sweating all over the body,anuria,agonizingpain,blood stained calculus stagnated in the urethra.

The study drug was prepared in Gunapadamlaboratory of National Institute of Siddha after the authentication of the herbal raw drugs by Botanist National Institute of Siddha and the mineral raw drugs by Rearch officer Chemistry, Department of Chemistry, Siddha Council Research Institute, Arumbakkam, and Chennai. The study drug was prepared by standard operating procedure as mentioned in the protocol.

The biochemical (qualitative) analysis of the study drug was done at the biochemistry laboratory of National Institute of Siddha. It revealedthe presence of mineral such as Carbonate, Iron, Chloride, and Ammonium. Physico chemical (quantitative) analysis and HPTLC weredone at Nobal Research Solution, Sathiyabama University, and Chennai.The study drug revealed the presence of phytocomponentssuch as alkaloids, phenols, proteins..

HPTLC fingerprint at 254 nmUV showed highest peak in 8^{th} peak (0.56Rf, 31.54% area) which could serve as a marker and and it is responsible for biological action.

In vitro study was done atNobal Research Solution, Sathiyabama University , Chennai. In vitro study revealed that, the study drug “Saaraparpam” has liththotriptic action; it acted well on Struvite type of stones.

The clinical study was conducted with a well defined protocol and a proper proformaafter getting the approval from the Institutional Ethical Committee (NIS/6-20/IEC/15-16).After the screening of 80 cases based on the Exclusion and Inclusion criteriareporting at the out patient department of department of Maruthuvam, 40 cases were inducted to the study. Before enrollment to the study the informed consent was obtained from the patients.

The patients were treated for a period of 48 days with Saaraparpam(internal) at the dose of 260mg, twice a day after food with the

adjuvant of Seergakudineer.

Clinical assessment was done during each visit in out patient department patients once in 8 days and the data were noted in the prescribed proforma.

Laboratory investigation & USG abdomen were done on 0th day and 48th day of the study for all the enrolled patients. All the patients were put under observation for 2 months follow up period without the study drug treatment.

THE OBSERVATIONS

Gender Distribution:

Among 40 cases male and female were equally affected (male-20, female-20)

Inference:

Testosterone may cause increased oxalate production in men.

Obesity, intake of high salt and sugar in the diet, increase the risk for women.

Women have higher urinary citrate concentration.(30)

Kaalam distribution:(Age)

Among 40 cases, 20 cases (50%) were found to be in vatha kaalam (1-33yrs of age) and 20 cases were (50%) in pitha kaalam (34-66yrs of age).

Inference:

The peak incidence of renal calculi occurred between 20 and 40 years of age {pitha kaalam (34-66 years)}

Occupational Reference:

Home makers accounts for highest number of occurrence i.e 17 cases (42.5%).

Dietary Habit:

Among 40 cases, 39 cases (97.5%) were non-vegetarian and one case (2.5%) wasvegetarian.

Inference:

Animal protein contain oxalate,calcium,phosphate,and other elements often lead to an excess excretion of them in urine.High intake of animal protein causes high urinary oxalate ,low PH ,low urinary citrate and high intake of salt causes hypercalciuria.However ,a reduced calcium diet can increase the risk of further stone formation.(28)

Drinking water:

Among 40cases, onecase (2.5%) was a well water drinker.In corporation and bore water drinkers category each 2 cases were reported, 35 cases were reported under mineral water drinkers.

Inference

In mineral water calciumand magnesium ratio is very high which can increase the risk of stone formation.(27)

Habits:

Among 40 cases, 2 cases (5%) were alcohol consumer; one case (2.5%) was asmoker.

Inference:

Cigarette smoking may induce urolithiasis by decreasing urinary flow and increasing serum cadmium and lead level.

On the other hand, smoking can increase production of reactive oxygen species and oxidative stress in the kidney, leading to renal injury. These injuries increase the nucleation, aggregation, and retention of crystals in the kidney thereby promoting the formation of stones. Stones are more common in men than in women. Since smoking tends to be more common in men this may be one of the reasons for higher rate of stones in male sufferers.

Alcohol act as a diuretic .This means that it causes people to pass so much urine that they can become dehydrated. Alcohol also interferes with the body's ability to excrete uric acid. (29)

Treatment History:

Among 40 cases, 2 cases (5%) had taken allopathic treatment in the past and discontinued 6 months before. The rest the 38 cases (95%) had not taken any other drugs prior to this study.

Family History:

Among 40 cases, 6 cases (15%) had positive family history.

Distribution of cases by Paruva kaalam (Seasons):

In this study, 20 cases (50%) were admittedin Munpani kaalam (Dec 16- Feb12), 20 cases (50%) were admitted in Pinpani kalam (Feb13-Apr13)

Thinai Distribution:

In this study, 27 cases (67.5%) were reported from Neithal thinai (coastal region), 13cases (32.5 %%) were reported from Marutham thinai (fertile land).

Inference:

Mineral content of water in the Neithal land (coastal area) may contribute to the formation of kidney stones.

Yakkai Distribution:

Among 40 cases, 16 cases (40%) were Vathathegi, 14 cases (35%) were Pithathegiand 4 cases (10%) were Kaphathegi, and 6cases were Thonthathegi.

Gunam Distribution:

Among 40 cases 34 cases (85%) possessed Rajogunam.

Distribution Of Cases By EnvagaiThervugal (Eight- Fold Examination)

In En vagaithervukal, Naadi was affected in all the 40 cases (100%), Sparisam was affected (numbness) in 8 cases (20%). Naa was affected (taste sensation) in 11 cases (27.5%). Niram was affected (pale/hypopigmentation) in 5 cases (12.5%).Vizhi was affected (myopia or presbiopia) in 12 cases (30%).

Moothiram was found to be affected (burning micturition /oliguria) in all the 40 cases (100%).

Malam was affected(constipation/loose stools) in 9 cases (22.5%)

Distribution of Cases By Naadi:

In this study, Azhal vali naadi was felt in 19 cases (47.5%).Azhaliyyam naadi was felt in 9 cases (22.5%).Valiiyyam naadi was felt in 5 cases(12.5%)Valiazhal naadi was felt in 3cases (7.5%).Iyyaazhal naadi was felt in 2 cases (5%). Valinaadi was felt in onecase (2.5%). Azhalnaadi was felt in one case (2.5%).

Distribution of Cases by Udal kattukal:

Among 40 patients, Saaram was affected (indigestion, general tiredness) in 20 cases(50%). Senneer was affected (reduction in Hb level) in 8 cases (20%) .Oon was affected (obesity/knee joint pain) in 7 cases (17.5%). Kozhuppu was affected (lower back ache) in 10 cases (25%). Enbu was affected(lower back ache, knee joint pain) in 10 cases (25%).Suronitham was affected (irregular menstruation) in 3 cases (7.5%)

Distribution of Cases by Kosangal:

Among 40 cases, Annamayakosam was affected (abdominal pain/ anorexia) in 25 cases (62.5%), Pranamayakosam was affected (cold, cough) in 19 cases(47.5%)Anandamayakosam was affected (sleep disturbance) in 3 cases (27.5%).Manomayakosam, Vignamayakosam were normal in almost all cases.

Derangement of Vatham:

Among 40 cases, Abaanan was affected(burning micturition) in 19 cases (47.5%),Pranan (anorexia) was affected in 9 cases(22.5%), Udhanan(nausea,vomiting) was affected in 9 cases(22.5%) , Samanan(derangement of other vayukkal) and Viyanan were affected(pain from loin to groin) in all the 40 cases (100%). Naagan was affected (dull vision) in 6 cases (15%), Koorman was affected (myopia or presbiopia) in6 cases (15%) Kirukaran was affected (loss of appetite) in 15 cases (37.5%), Dhevathathan was affected (general tiredness) in all 40 cases (100%).

Derangement of Pitham

Among 40 cases, .Anarpitham was affected(loss of appetite/abdominal pain) in 15 cases (37.5%), Ranjagapitham was affected(low Hb gm%) (in 5 cases (12.5%) , Alosakapitham was affected(dull vision) in 5% cases (12.5%), Prasakapitham was affected(dryness of skin) in 5 cases (12.5%).

Derangement of Kapam

Avalambagam was affected(derangement of other types of kapam) in 33 cases (82.5%),Kilethagam was affected(loss of appetite) in13 cases (32.5%), Pothagam was affected(tastelessness) in2 cases (5%), Tharpagam was affected(burning sensation of

the eyes) in 21 cases (52.5%), Santhikam(lower back ache) was affected in 9 cases (22.5%).

Distribution of cases by Neerkuri:

Colour

In before treatment, pale yellow coloured urine was observed in 23 cases (57.5%), yellow coloured urine was observed in 7 cases (17.5%) ,colourless urine was observed in 8 cases (20%)

In after treatment, pale yellow coloured urine was observed in 24 cases (60%) ,yellow coloured urine was observed in 9 cases (22.5%),dark yellow coloured urine was observed in one case(2.5%), straw coloured urine was observed in one case (2.5%), colourless urine was observed in 5 cases (12.5%).

Volume

The volume of urine was reduced in 15 cases (37.5%), rest of cases had normal urine volume.

Manam

Foul smell was observed only in 2 cases (5%)

Nurai

Froth was observed only in one case (2.5%)

Edai

Normal in all cases

Enjal

Enjal present in 2 cases (plenty of pus cells), in other cases it was normal.

Distribution of Cases By Neikuri:

Among 40 cases the neikuri in 15 cases (37.5%) was observed as pearl shaped (kaphaneer).In one case (2.5%)the neikuri was observed as ring shaped (Azhalneer).In 10 cases (25%) the neikuri was observed as round shape.In 12 cases (30%) the neikuri was observed as sieve pattern . In 2 cases (5%) theneikuri was observed as irregular shape.

Distribution of calculus in Urinary System:

Among 40 cases, 22 cases (55%) had bilateral renal caculi, 11 cases (27.5%) hadin right kidney and 6cases (15%) had in left kidney, one cases (2.5%) had left ureteric calculi.

Distribution of cases by chronicity of illness:

Among 40 cases, 0 - 3 months chronicity of illness was found in 12cases (30%), 4 -6 months chronicity of illness was found in 9 cases (22.5%), 7-9 months chronicity of illness was found in 5 cases (12.5%), more than 9 months of chronicity of illness was found in14 cases (35%).

Clinical features (before treatment):

In clinical features, all the 29 cases (72.5%) had pain from loin to groin region.9 cases(22.5%) had burning micturition and 22 cases (55%) had abdominal pain, onecase (2.5%) had nausea,4 cases (10%) had agonizing pain, one case (2.5%) had vomiting and 6 cases (15%) had oliguria , 6 cases (15%) had dysuria, 2 cases (5%) had pain in the urethra.

Outcome:

Primary Outcome Observation:

Result From USG Abdomen After Treatment:

Out of 40 cases stone completely dissolved in 15 cases (37.5%), Size (>3mm<10mm) and number of stone is reduced in 16 cases (40%) , In 9 cases (22.5%) there was no changes in number and size of the stone.

Based on above results, 15% cases (37.5%) showed good improvement and 16 cases (40%) showed moderate improvement, 9 cases (22.5%) showed poor response.

Good	-	Stone completelydissolved
Moderate	-	Reduction in number and size of the calculi.
Poor	-	No change in stone size and number.

Secondary outcome observation:

Improvement in Clinical Feature:

Symptoms such as Burning micturition,abdominalpain, yellowcoloured urination, oliguria, nausea, vomiting and agonizing pain were relieved in almost all the 40 cases (100%). Pain from loin to groin region was relieved in 35 cases (87.5%), except in 5 cases (12.5%) where (the pain from loin to groin region) persisted.

Improvement:

Among 40 cases 22 cases (55%) had clinically good improvement (symptoms completely relieved) after treated with study drug, 13cases (32.5%) had moderate improvement (symptoms reduced), 5 cases (12.5%) had no improvement (symptoms persisted).

SUMMARY

- The aim of the study is to evaluate the therapeutic efficacy of the drug Saaraparpam (internal) in Azhalkalladaippu.
- Before initiating the clinical study, approval was got from the Institutional Ethical committee (NIS/6-20/IEC/15-16) for conducting the clinical study.
- The herbal raw drugs were authenticated by Botanist NIS and the mineral raw drugs were authenticated by Research Officer chemistry,Department of Chemistry,Siddha Council Research Institute ,Arumbakkam,Chennai and the study drug was prepared by the investigator in the Gunapadam laboratory of National Institute of Siddha as per the standard operating procedure mentioned in the protocol.
- The biochemical (qualitative) analyses were done at the bio chemistry lab of National Institute of Siddha.
- Physico chemical (quantitative) analysis, phytochemical analysis of the study drug, HPTLC and in vitro lithotripticactivity of Saara parpam were done at Nobal Research Solutions, SathiyabamaUniversity, and Chennai.
- For clinical study 80 cases were screened based on inclusion and exclusion criteria at the out patient department of Department of Maruthuvam, National Institute of Siddha.Out of 80 cases 40 cases were recruited for the clinical study.Clinical diagnosis of Azhalkalladaippu was arrived by both Siddha and modern methodologies.
- Required laboratory investigations were carried out before and after treatment and the concerned data were recorded in the proforma.Before initiating the study, informed consent was obtained from the patients.
- A day before starting the study drug treatment, purgation was given (Agathiyar kulambu 130mg with Sankankuppi juice) early morning in empty stomach to the patientscorrect the elevated mukkutram.
- The patients were treated for a period of 48 days.The study medicine selectedwas Saaaraparpam at the dose of 260mg twice a day with adjuvant of seerga kudineer after food. (Ref. Patharthaguna vilakkam page no 140-141)

- Clinical assessment was done during each visit once in 8 days and the data were noted in the prescribed proforma. During the study period there was no event of any adverse reactions owing to the drug wasreported.
- The biochemical study of the study drug revealed the presence of chloride, Iron, ammonium, etc.
- The study drug revealed the presence of phytocomponents such as alkaloids, phenols, proteins.

- In vitro study revealed that, the study drug "Saaraparpam" has liththotriptic action; it acted well on Struvite type of stones.
- Statistical analysis showed significant difference between before and after treatment in the kidney stone size($p<0.0001$) and symptoms($p<0.0001$)
- Clinically out of 40 cases, 22 cases (55%) had clinically good improvement (symptoms completely relived) after treated with study drug, 13cases (32.5%) had moderate improvement (symptoms reduced). 5 cases (12.5%) had no improvement.
- All the 40 cases were taken ultra sonography, before and after the completion of the trial drug treatment.
- Based on the USG Abdomen reports out of 40 cases 15 cases (37.5%) showed good improvement stone completely dissolved) 16 cases (40%) showed moderate improvement(reduction in number and size) and 9cases (22.5%) cases showedpoor prognosis (no change in size and number of stone).

CONCLUSION

The aim of the study was to evaluate the therapeutic efficacy of the study drug Saara parpam (internal) in Azhal kalladaippu.

Clinical study revealed the therapeutic efficacy of the study drug was read from USG Abdomen reports. 15 cases (37.5%) showed good improvement (symptoms completely relieved), 16 cases (40%) showed moderate improvement (symptoms reduced) and 9 cases (22.5%) showed poor prognosis (symptoms persisted).

After treatment ,out of 40 cases 22 cases (55%) showed goodclinial improvement (symptoms completely relieved) ,13 cases(32.5%) had moderate improvement(symptoms reduced), 5 cases (12.5%) showed no improvement There were no adverse reaction complaint received during the study.

There were no recurrences of renal stone during thefollow up period of two months. Statistical analysis showed significant difference between before and after treatment in the kidney stone size ($p<0.0001$) and symptoms ($p<0.0001$) Because of the encouraging clinical outcome, the study may be further carried out with the same drug in large number of cases in future.

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 47

AYOTHIDASAR PANDITHAR HOSPITAL

DEPARTMENT OF MARUTHUVAM

AN OPEN CLINICAL STUDY ON "AZHAL KALLADAIPPU" (RENAL CALCULI) AND THE DRUG OF CHOICE IS "SAARA PARPAM" (INTERNAL)

FORM I - SCREENING AND SELECTION PROFORMA

1. O.P No _____ 2. I.P No _____ 3. S.No: _____

4. Name: _____ 5. Age (years): 6. Gender: Female/male

7. Contact No: ----------

8.INCLUSION CRITERIA:

Patients who will fulfill any of the following criteria will be included in the study:

- Age:20-60 yrs
- Sex: Both sex
- Patients who are having the classical symptoms of abdominal pain, distension, pain from loin to groin, pain in urethra, agonizing pain, dysuria, oliguria, yellow coloured urination, burning micturition, haematuria, nausea, vomiting.
- Patient with renal calculus detected on USG Abdomen**,** Stone size:≥4mm & 10mm≤
- Patient willing to sign the informed consent stating that he/she will conscientiously stick to the treatment during 48 days but can opt out of the trial of his/her own conscious discretion.

Patient who are willing to take Ultrasonography investigation (USG- Abdomen/ KUB) and provide blood for lab investigation

9.EXCLUSION CRITERIA:

Stone size > 10mm	Yes	No
Pregnancy and laction		
Presence of any associated severe systemic illness eg.CA		
Diabetes mellitus		
Hypertension		
Chronic kidney disease		
Cardiac disease		

10.ADMITTED TO TRAIL: YES NO If Yes Serial No:

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer:

Signature of the HOD

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 47

AYOTHIDOSS PANDITHAR HOSPITAL

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AN OPEN CLINICAL STUDY ON "AZHAL KALLADAIPPU" (RENAL CALCULI) AND THE DRUG OF CHOICE IS "SAARA PARPAM" (INTERNAL)

FORM II-CASE RECORD FORM

1. Serial No: _____ 2. OP/IP No:----------

3. Name: _____ 4. Gender: Female/male

5. Age (years): _____ DOB ☐☐ ☐☐ ☐☐☐☐

Date Month Year

6.Address:-----

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7. A)Occupation: ---------- B) Nature of work----------

8. Educational Status: A) Illiterate ☐ B)Literate ☐

9.Height: --------- cms 10.Weight: ---------- kg

11. Complaints and Duration:

_____

_____

_____

_____

12.Habit of

A) Smoking 1. Yes; duration _____ years; Number- 2.No

B)Tobacco chewing 1. Yes; duration _____ years 2.No

C)Betel chewing 1. Yes; duration _____ years 2.No

D)Alcoholism 1. Yes; duration _____ years;Quantity- ml 2.No

13. Dietary style: A.Pure vegetarian ☐ B.Non-vegetarian ☐ C. mixed diet ☐

14. Drug History: Had the patient been treated before with allopathic drug?

A) Yes ☐ 2) No ☐

15 MARITAL STATUS:1.Married ☐ 2.Unmarried ☐

No of children: ☐ male: ☐ female: ☐

16. FAMILY HISTORY:

Whether this problem runs in family? 1. Yes ☐ 2.No ☐

If yes, mention the relationship of affected person(s) ----------

17. MENSTRUAL HISTORY:

18. BOWEL HABITS & MICTURITION: Normal ☐

Historyof habitual constipation 1.Yes ☐ 2.No ☐

History of frequent diarrhea 1.Yes ☐ 2.No ☐

History of frequent dysuria 1.Yes ☐ 2.No ☐

(Burning micturition/haematuria)

19. **PSYCHOLOGICAL STATE:**

Normal ☐ Anxiety ☐ Depression ☐

20.SIDDHA SYSTEM OF EXAMINATION:

ENVAGAI THERVU:

I.NAADI:

	0^{th} day	8^{th} day	16^{th} day	24^{th} day	32^{nd} day	40^{th} day	49^{th} day
Vali							
Azhal							
Iyyam							
ValiAzhal							
Azhalvali							
Iyyavali							
ValiIyyam							
AzhalIyyam							
IyyaAzhal							

II.NAA:

	0^{th} day	8^{th} day	16^{th} day	24^{th} day	32^{nd} day	40^{th} day	49^{th} day
Colour	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow
Taste	Sweet/Sour/ Pungent/ Bitter/None	Sweet/Sour / Pungent/ Bitter/None	Sweet/Sour/ Pungent/ Bitter/None	Sweet/Sour / Pungent/ Bitter/None	Sweet/Sour / Pungent/ Bitter/None	Sweet/Sour / Pungent/ Bitter/None	Sweet/Sour/ Pungent/ Bitter/None
Coating	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Fissure	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Saliva	Normal/ Increased/ Decreased	Normal/ Increased/ Decreased	Normal/ Increased/ Decreased	Normal/ Increased/ Decreased	Present/ Absent	Present/ Absent	Present/ Absent
Dryness	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Glossitis	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Baldness	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent

III.NIRAM:

0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown	Dark/pale/ Yellow tinted/ wheatish brown

IV.MOZHI:

0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Medium/ High/ Low pitched	Medium/ High/ Low pitched	Medium/ High/ Low pitched	Medium/ High/ Low pitched	Medium/ High/ Low pitched	Medium/ High/ Low pitched	Medium/ High/ Low pitched

V.VIZHI:

0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
normal/ Red pale/yellow	normal/Red pale/yellow	normal/Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow	normal/ Red pale/yellow

VI. MALAM:

	0th day	**8th day**	**2ndwk**	**24th day**	**32nd day**	**40th day**	**49th day**
Colour	Dark/pale/ yellow/ Red	Dark/pale/ yellow/ Red	Dark/pale/ Yellow/ Red	Dark/pale/ yellow/ Red	Dark/pale/ yellow/ Red	Dark/pale/ yellow/ Red	Dark/pale/ yellow/ Red
Consistency	Solid/ Semisolid/ Watery	Solid/ Semisolid/ Watery	Solid/ Semisolid /Watery	Solid/ Semisolid/ Watery	Solid/ Semisolid/ Watery	Solid/ Semisolid/ Watery	Solid/ Semisolid/ Watery
stool bulk	Normal/ Reduced	Normal/ Reduced	Normal/ Reduced	Normal/ Reduced	Normal/ Reduced	Normal/ Reduced	Normal/ Reduced
Constipation	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Diaarhoea	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent

VII.MOOTHIRAM:

Neerkkuri	**0th day**	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Niram [Colour]	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear	Yellow/ Red/ White/ Straw coloured/ Crystal clear
Manam[Odour]	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Nurai[Froth]	Nil/ Reduced/ Increasd	Nil/ Reduced/ Increased	Nil/ Reduced/ Increased	Nil/ Reduced/ Increased	Nil/ Reduced/ Increased	Nil/ Reduced/ Increased	Nil/ Reduced/ Increased
Edai[Sp.gravity]	Normal/ Increasd/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced
Enjal[Deposits]	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent	Present/ Absent
Volume	Normal/ Increasd/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced	Normal/ Increased/ Reduced

Neikkuri	**0th day**	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Serpentine fashion	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints
Annular/ Ringed fashion	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints
Pearl beaded fashion	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints
Mixed fashion	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints
Other fashion	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints	at___ mints

VIII. SPARISAM:

0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Warmth/ Hot/ cold/ Sweat	Warmth/ Hot/cold/ Sweat	Warmth/Hot /cold/ Sweat	Warmth/Hot / cold/ Sweat	Warmth/Hot /cold/ Sweat	Warmth/Hot /cold/ Sweat	Warmth/Hot /cold/ Sweat

THEGI:

Vatham predominant		Kabam predominant	
Pitham predominant		Thondha thegi	

NILAM:

Kurinji ☐ Mullai ☐ Marutham ☐ Neithal ☐ Paalai ☐

KAALAM:

Kaarkalam ☐ Pinpanikalam ☐ Koothirkalam ☐

Ilavenil ☐ Munpanikalam ☐ Muthuvenil ☐

GUNAM:

Sathuvam ☐ Rasatham ☐ Thamasam ☐

IYMPORIGAL:

	0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**48th day**
	Normal/ Affected	**Normal/ Affected**	**Normal/ Affected**	**Normal/ Affected**	**Normal/ Affected**	**Normal/ Affected**	**Normal/ Affected**
Mei [Skin							
Vaai [Buccalcavity]							
Kan [Eyes]							
Mooku[Nose]							
Sevi [ear]							

KANMA INTHIRIYANGAL:

	0th day	8th day	16th day	24th day	32nd day	40th day	48th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Kai [upperlimb]							
Kal [lowerlimb]							
Vai[Buccal cavity]							
Eruvai [excretory organ]							
Karuvai [Reproductive organ]							

KOSAM:

	0th day	8th day	16th day	24th day	32nd day	40th day	49th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Annamayakosam							
Pranamaya Kosam							
Manonmayakosam							
Vingyanamayakosam							
Anandhamayakosam							

MUKKUTRAM:

A) VATHAM:

	0th day	8th day	16th day	24th day	32ndtday	40th day	49th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Praanan							
Abaanan							
Samaanan							
Udhaanan							
Viyaanan							
Naahan							
Koorman							
Kirukaran							
Devathathan							
Dhananjeyan							

B) PITHAM:

	0th day	8th day	16th day	24th day	32nd day	40th day	49th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Analapitham							
Prasakam							
Ranjakam							
Aalosakam							
Saathakam							

C) KABAM:

	0th day	8th day	16th day	24th day	32nd day	40th day	49th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Avalambagam							
Kilethagam							
Pothagam							
Tharpagam							
Santhigam							

SEVEN DHATHUKKAL:

	0th day	8th day	16th day	24th day	32nd day	40th day	49th day
	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected	Normal/ Affected
Saaram[chyme]							
Senneer[Blood]							
Oon[Muscle]							
Kozhuppu[Fat]							
Enbu[Bones]							
Moolai[Bonemarrow]							
Sukkilam/ Suronitham [Genital discharges]							

SYSTEMIC EXAMINATION:

	0th day	8th day	16th day	24th day	32nd day	40th day	49th day
CardioVascularSystem							
Respiratory System							
Gastrointestinal System							
CentralNervous System							
Endocrine System							

GENERAL EXAMINATION:

	0th day	8th day	16th day	24th day	32nd day	40th day	49thday
Height (cms)							
Weight (kg)							
Temperature(°F)							
Pulse rate (permin)							
Heart rate (per min)							
Respiratory rate(per min)							
Blood pressure(mm/Hg)							
Pallor							
Jaundice							
Cyanosis							
Lymphadenopathy							
Pedal edema							
Clubbing							
Jugular vein pulsation							

CLINICAL SYMPTOMS:

	0th day	**8th day**	**16th day**	**24th day**	**32nd day**	**40th day**	**49th day**
Abdominal pain							
Pain from loin to groin							
Agonizing pain							
Pain in urethra							
Yellow coloured urination							
Burning micturition							
Oliguria							
Dysuria							
Abdominal distension							
Nausea & Vomiting							
Haematuria							

USG- Whole Abdomen

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer:

Signature of the HOD

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 47

AYOTHIDASARPANDITHARHOSPITAL

DEPARTMENT OF MARUTHUVAM

AN OPEN CLINICAL STUDY ON"AZHAL KALLADAIPPU" (RENAL CALCULI) AND THE DRUG OF CHOICE IS "SAARA PARPAM" (INTERNAL)

FORM III LABORATORY PARAMETERS-CHART

1. OP/IP No: _____ 2.S. No. _____4. Name: _____

5. Age: _____ years 6. Gender: M/F

BLOOD INVESTIGATION		**0th DAY Date:**	**49th day Date**
HB(gms%)			
T.RBC(milli/cu.mm)			
ESR (mm)	**½ hr.**		
	1 hr.		
T.WBC (cu.mm)			
	Polymorphs		
DIFFERENTIAL COUNT (%)	**Lymphocytes**		
	Monocytes		
	Eosinophils		
	Basophils		

Blood glucose (mg/dl)	**Fasting**		
	PP		
	Random		
Lipid profile (mg/dl)	**Serum cholesterol**		
	HDL		
	LDL		
	VLDL		
	TGL		

RFT (mg/dl)	**Blood urea**		
	Serum creatinine		
	Serum Uric acid		
LFT (mg/dl)	**Total bilirubin**		
	Direct bilirubin		
	Indirect bilirubin		
	Serum totalprotein		
	Serum Albumin		
	Serum globulin		
	Fibrinogen(g/dl)		
	Serum calcium		
	Serum phosphorous		
	SGOT (IU/L)		
	SGPT (IU/L)		
	Alkaline phosphatase (IU/L)		

URINE INVESTIGATION	**Before TMT Date:**	**After TMT Date:**
Albumin		
Neerkkuri		
Niram		
Manam		
Nurai		
Edai		
Enjal		
Neikkuri		
Fasting sugar		
PP sugar		
Random Sugar		
Deposits		
Bile salts		
Bile pigments		
Urobilinogen		
Culture & sensitivity		
MALAM		
Ova		
Cyst		
Occult blood		

SCAN: USG ABDOMEN

Specific investigation		Size of the kidney	Site of the calculus	No of calculus	Size of the calculus	Hydro nephrosis
Rt kidney	Before treatment (0^{th} day)					
	After treatment (49^{th} day)					
Lt kidney	Before treatment (0^{th} day)					
	After treatment (49^{th} day)					

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer:

Signature of theHOD

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FORM IV (DRUG COMPLIANCE FORM)

S. NO: --------- OPD/IPD NO : ---------- NAME :----------

Name Of The Drug :SAARA PARPAM, 2 kuntri (twice/day) Seeragakudineer

Day	Date	Morning	Evening
Day 1			
Day2			
Day3			
Day4			
Day5			
Day6			
Day7			
Day8			
Day9			
Day10			
Day11			
Day12			
Day13			
Day14			
Day15			
Day16			
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Day39			
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Day41			
Day42			
Day43			
Day44			
Day45			
Day46			
Day47			
Day48			

Station:

Date:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

முதன்மைஆராய்ச்சியாளர் பெயர் : Dr. அ. அஜிதா

நிறுவனத்தின் பெயர் : தேசியசித்தமருத்துவநிறுனம்
தாம்பரம் சானட்டோரியம்
சென்னை-47

Dr. அ. அஜிதா ஆகிய நான் தேசிய சித்த மருத்துவமனையில் பட்ட மேற்படிப்பு பயின்று வருகிறேன். அழல் கல்லடைப்பு நோய் எளிதில் குணப்படுத்த கூடிய நோயாகும். இந்நோயானது சிறுநீரக மற்றும் சிறுநீரக பாதையில் உப்பு வீழ்படிதல் போன்ற காரணங்களால் உண்டாகிறது. இந்நோய் நீர்புழையில் இரும்பை காய்ச்சி சுட்டது போல் எரிச்சல் உடல் முழுவதும் அனலாக இருத்தல்: சிறுநீருடன் குருதி வெளிபடுதல்:

நீர் புழையில் குடைவது மற்றும் குத்துவதுபோல் வலித்தல் மற்றும் நீரிழியும் போது செந்நிறகற்கள், போன்ற குறி குணங்களை தோற்றுவிக்கும். இந்நோய்க்கு தேசிய சித்த மருத்துவமனையில் பல சித்த மருந்துகள் பயன்படுத்தப்பட்டு வருகின்றது. சித்த மருத்துவபட்ட மேற்படிப்பில், ஆய்வின் ஒரு பகுதியாக புதிய மருத்துகளை பயன்படுத்தும் நோக்கில் (சாரபற்பம்) என்னும் மருந்தினை இந்நோய்க்கு வழங்க பரிந்துரை செய்கிறோம். இந்தமருந்தின் செய்முறை. அளவு, அனுபானம் மற்றும் மருத்துவ பயன்கள் அனைத்தும் அங்கீகரிக்கப்பட்ட சித்த மருத்துவ நூலில் கூறப்பட்டுள்ளது. எந்த வித கட்டாயமுமின்றி தாங்கள் இந்த மருந்தினை பெற்றுக்கொள்ளலாம். இந்த ஆய்வில் மருந்துஉட்கொள்ளும் காலம் 48 நாட்கள் ஆகும். வாரம் ஒருமுறை தேசிய சித்த மருத்துவமனைக்கு நேரில் வந்து 8 நாட்களுக்கான மருந்தினை பெற்றுக் கொள்ள வேண்டும். இந்த ஆய்வு சம்பந்தமான ஆய்வக பரிசோதனைகள் கட்டணமின்றி செய்யப்படும். நாட்கள் மருந்து உட்கொள்ளும் காலம் முடிந்த பிறகு நோய்க்கான குறி குணங்கள் மற்றும் ஆய்வக பரிசோதனைகள் இவற்றின் முடிவுகளின் அடிப்படையில் மருந்தின் பரிகரிப்புத் திறன் கண்டறியப்படும்.

இந்த ஆய்வு சம்பந்தமாக சில கேள்விகளை தங்களிடம் கேட்க இருக்கிறேன். தங்களிடமிருந்து பெறப்படும் கருத்துகள் மற்றும் குறிப்புகள் அனைத்தும் நம்பிக்கையாக பதிவு செய்யப்படும். இந்த ஆய்வில் தங்களை உட்படுத்திக் கொள்வதின் மூலம் எந்த வகையிலும் பாதிப்புக்குள்ளாக மாட்டீர்கள்

அளிக்கிறேன். என உறுதி அளிக்கிறேன். எந்த வித வற்புறுத்தலுமின்றி, இந்த ஆய்வில் பங்கேற்கவும், இந்த ஆய்வு சம்பந்தமாக கேட்கப்படும் கேள்விகளுக்கு பதில் கூறவும் தங்களுக்கு முழு சுதந்திரம் அளிக்கப்படுகிறது. இந்த ஆய்வில் பங்கேற்பதற்கு எந்த சன்மானமும் வழங்கப்படமாட்டது. ஆனால், ஆய்வு முழுவதும் எனது மேற்பார்வையிலும், தங்கள் உடல் நலன் குறித்த தனி கவனத்திலும் ஆய்வு மேற்கொள்ளப்படும். இந்நோய்க்கான புதிய மருந்தின் பரிகரிப்புத் திறனை சமூகத்திற்கு உணர்த்தும் வகையில் இந்த ஆய்வு மேற்கொள்ளப்படுகிறது. இந்த ஆய்வினைத் தொடரதங்களுக்கு விருப்பம் இல்லையெனில் எப்பொழுது வேண்டுமானலும் ஆய்வின் 144 இடையில் விலகிக் கொள்ளவும், இம்மருத்துவமனையில் வழங்கப்படும் இந்நோய்க்கான வழக்கமான மருந்துகளை பெற்றுக் கொள்ளவும் அறிவுறுத்தப்படுகிறீர்கள்.

இந்த ஆய்வில் சேகரிக்கப்படும் விபரங்கள் அனைத்தும் தங்களுக்கு முதன்மை ஆராய்ச்சியாளரான எனக்கும் இடையில் ரகசியமாக வைக்கப்படும். கேள்வி பதில் வடிவத்தில் தங்களிடம் கேள்விகள் கேட்கப்படும். அனைத்துப் படிவங்களிலும் தங்களின் பெயர் தவிர்க்கப்பட்டு ஆய்வாளரல் தங்களுக்கென தனிக் குறியீடு வழங்கப்படும், அந்தக் குறியீடு ஆய்வாளருக்கு மட்டுமே தெரிந்ததாக இருக்கும். நீங்கள் இந்த ஆய்வில் பங்கேற்க விருப்பப்பட்டால், திட்டவரைவு படி தேர்வு செய்யப்படுவீர்கள்.

நீங்கள் இந்த ஆய்வில் பங்கேற்கும் முன், இந்த ஆய்வினைப் பற்றிய மேலும் விபரங்கள் பெற வேண்டுமென விருப்பப்பட்டால், - இந்த ஆய்வின் ஆராய்ச்சியாளர் மற்றும் தேசிய சித்த மருத்துவமனை ,பட்ட மேற்படிப்புத் துறைமாணவி Dr. அ. அஜிதாஆகிய என்னை 9042753209 என்ற எண்ணில் தொடர்பு கொள்ளலாம். மேலும், நீங்கள் இந்த ஆய்வில், உங்களது பங்கேற்பு மற்றும் உரிமை பற்றி தெரிந்து கொள்ள தேசிய சித்த மருத்துவமனை, தலைவர் / செயற்குழு உறுப்பினர் அவர்களையும் 91-44-22511611 என்ற எண்ணில் தொடர்பு கொள்ளலாம்.

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DEPARTMENT OF MARUTHUVAM

AN OPEN CLINICAL STUDY ON "AZHAL KALLADAIPPU" (RENAL CALCULI) AND THE DRUG OF CHOICE IS "SAARA PARPAM" (INTERNAL)

FORM VI-INFORM CONSENT FORM

CERTIFICATE OF CONSENT

"I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction.

I consent voluntarily to participate as a participant in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care".

"I have received a copy of the information sheet/consent form".

In case of illiterate participant

"I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely."

Date:

Signature of a witness

Left thumb Impression of the Participant

(Selected by the participant bearing no connection with the survey team)

Date:

Station:

Signature of participant:

Signature of the Investigator:

Signature of the Lecturer: Signature of the HOD

From VI -ஒப்புதல் படிவம்

நான் மேற்கூறிய தகவல் படிவத்தை அல்லது படிக்க கேட்டு கொண்டேன். இது தொடர்பான விளக்கங்களையும் கேட்டு தெரிந்து கொண்டேன். எந்த வித வற்புறுத்தலின்றி, என் சொந்த விருப்பத்தின் பேரில் என்னை இந்த ஆராய்ச்சிக்கு உட்படுத்த என் முழு மனதோடும் சுய நினைவோடும் சம்மதம் தெரிவிக்கின்றேன். எனக்கு விருப்பமில்லாத பட்சத்தில் இந்த ஆராய்ச்சியில் இருந்து என்னை எப்போது வேண்டுமானாலும் விடுவித்து கொள்ளும் உரிமையை பெற்றுள்ளேன் என்பதையும் அறிவேன்.

தேதி:

இடம்:

சாட்சிக்காரர் கையொப்பம்:

சாட்சிக்காரரின் பெயர்:

கையொப்பம்: உறவுமுறை:

பெயர்: மரு. கையொப்பம்:

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 47

AYOTHIDASARPANDITHARHOSPITAL

DEPARTMENT OF MARUTHUVAM

AN OPEN CLINICAL STUDY ON "AZHAL KALLADAIPPU" (RENAL CALCULI) AND THE DRUG OF CHOICE IS "SAARA PARPAM" (INTERNAL)

FORM VII - (WITHDRAWAL FORM/ADVERSE DRUG REACTION FORM/PHARMACOVIGILENCE FORM)

1)S. NO: ---------- **2) OPD/ IPD NO: ----------**

4)NAME:---------- **5) AGE: ---------** **6) GENDER: M/F--------**

Date of trial commencement:

Date of withdrawal from trial:

REASONS FOR WITHDRAWAL:

- Long absence at reporting : Yes/ No
- Irregular treatment : Yes/ No
- Shift of locality : Yes/No
- Increase in severity of symptoms : Yes/No
- Complication/Adverse reactions if any : Yes/No
- Poor patient compliance : Yes/No

NATIONAL PHARMACOVIGILANCE PROGRAMME FOR SIDDHA DRUGS

Reporting Form for Suspected Adverse Reactions to Siddha Drugs

1 **Please note:**

i. All consumers / patients and reporters information will remain confidential.

ii. It is requested to report all suspected reactions to the concerned, even if it does not have complete data, as soon as possible.

Peripheral Center code: State:

1. Patient / consumer identification (please complete or tick boxes below as appropriate)

<table>
<tr><td>Name</td><td>Father name</td><td rowspan="2">Patient / Record No.</td></tr>
<tr><td>Ethnicity</td><td>Occupation</td></tr>
<tr><td colspan="2" rowspan="2">Address
Village / Town
Post / Via
District / State</td><td>Date of Birth / Age:</td></tr>
<tr><td>Sex: Male / Female
Weight :
Degam:</td></tr>
</table>

2. Description of the suspected Adverse Reactions (please complete boxes below)

Date and time of initial observation		Season:
Description of reaction		Geographical area:

3. List of all medicines / Formulations including drugs of other systems used by the patient during the reporting period:

Medicine	Daily dose	Route of administration & Vehicle – Adjuvant	Date		Diagnosis for which medicine taken
			Starting	Stopped	
Siddha					
Any other system of medicines					

4. Brief details of the Siddha Medicine which seems to be toxic :

Details	Drug – 1	Drug – 2	Drug - 3
a) Name of the medicine			
b) Manufacturing unit and batch No. and date			
c) Expiry date			
d) Purchased and obtained from			
e) Composition of the formulation / Part of the drug used			

a) Dietary Restrictions if any
b) Whether the drug is consumed under Institutionally qualified medical supervision or used as self medication.
c) Any other relevant information.

5. Treatment provided for adverse reaction:

6. The result of the adverse reaction / side effect / untoward effects (please complete the boxes below)

<table>
<tr><td>Recovered:</td><td>Not recovered:</td><td>Unknown:</td><td>Fatal:</td><td>If Fatal
Date of death:</td></tr>
<tr><td rowspan="2">Severe: Yes / No.</td><td colspan="4">Reaction abated after drug stopped or dose reduced:</td></tr>
<tr><td colspan="4">Reaction reappeared after re introduction:</td></tr>
</table>

Was the patient admitted to hospital? If yes, give name and address of hospital	

7. Any laboratory investigations done to evaluate other possibilities? If Yes specify:

8. Whether the patient is suffering with any chronic disorders?

Hepatic Renal Cardiac Diabetes Malnutrition

Any Others

9. H/O previous allergies / Drug reactions:

10. Other illness (please describe):

11. Identification of the reporter:

Type (please tick): Nurse / Doctor / Pharmacist / Health worker / Patient / Attendant / Manufacturer / Distributor / Supplier / Any others (please specify)
Name:
Address:
Telephone / E – mail if any :

Signature of the reporter: **Date:**

Please send the completed form to:

Name & address of the RRC-ASU / PPC-ASU

The Director

National Institute of Siddha,

Centre For Siddha Medicine),

ı, Chennai-600 047.

Fax : 044 – 22381314

Website :www.nischennai.org

Email: nischennaisiddha@yahoo.co.in

* *

This filled-in ADR report may be sent within one month of observation /occurrence of ADR

Who Can Report?

⇒ Any Health care professionals like Siddha Doctors / Nurses / Siddha Pharmacists / Patients etc.

What to Report?

⇒ All reactions, Drug interactions,

Confidentiality

⇒ The patient's identity will be held in strict confidence and protected to the fullest extent.

⇒ Submission of report will be taken up for remedial measures only not for legal claim

Signature of the Lecturer:

Date :

Station:

Signature of the Investigator:

Signature of the Lecturer:

Signature of the HOD

NATIONAL INSTITUTE OF SIDDHA CHENNAI - 47

AYOTHIDASS PANDITHAR HOSPITAL

DEPARTMENT OF MARUTHVAM

An Open Clinical Trial of SaaraParpamFor The Treatment Of AzhalKalladaippu (Renal Calculus)

FORM VIII

DIETARY ADVISE FORM

தவிர்க்கவேண்டியவைகள்

- தக்காளி
- முட்டைகோஸ்
- காலிபிளவர்
- பீன்ஸ்
- காபி / டீ
- சாக்லேட்
- மாமிசம்
- குளிர்பானம்
- திராட்சை
- பால்,பால் பொருட்கள்
- உருளைகிழங்கு
- பீட்ரூட்
- காளான்
- புகையிலை
- பதப்படுத்தப்பட்டஉணவுகள்
- காரபொருட்கள்
- அதிகஉப்புநிறைந்தஉணவுமற்றும் நீர்

சேர்த்துக் கொள்ளவேண்டியவைகள்

- முள்ளங்கி
- கீரைதண்டு
- சிறுகீரை
- பசலைகீரை
- வெண்டை
- அவரை
- காசினிகீரை
- பார்லிஅரிசிகஞ்சி
- வாழைத்தண்டு
- சுரைக்காய்
- கேரட்
- தர்பூசனி
- அன்னாசி
- பப்பாளி
- சீரககுடிநீர்
- கொள்ளு
- தண்ணீர் 1 ½ - 3 லிட்டர்

The Tamil Nadu Dr.M.G.R.Medical University

69,Anna Salai,Guindy,Chennai - 600 032.

This Certificate is awarded to Dr/Mr/Mrs..... A. Ajitha .....

for participating as ~~Resource~~ ~~Person~~ / Delegate in the Eighteenth Workshop on

" RESEARCH METHODOLOGY & BIOSTATISTICS "

FOR AYUSH POST GRADUATES & RESEARCHERS

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University from 20 th to 24 th July 2015.

Dr.N.KABILAN, M.D.(Siddha)
READER,DEPT.OF SIDDHA

Prof. **Dr.P.ARUMUGAM,** M.D.,
REGISTRAR i/c

Prof. **Dr.D.SHANTHARAM,** M.D., D.Diab.,
VICE - CHANCELLOR

NATIONAL INSTITUTE OF SIDDHA
राष्ट्रीय सिद्ध संस्थान
Department of AYUSH- MINISTRY OF HEALTH & FAMILY WELFARE
आयुष विभाग - स्वास्थ एवं परिवार कल्याण मंत्रालय
GOVERNMENT OF INDIA-भारत सरकार
TAMBARAM SANATORIUM, CHENNAI -600 047 -ताम्बरम सनटोरियम चेन्नई -600 047
फ़ोन\Tele : 044-22411611 फैक्स\Fax : 22381314
ईमेल: nischennaisiddha@yahoo.co.in वेब :www.nischennai.org

F.No.NIS/6-20/IEC/15-16 Dt: 05.10.2015

CERTIFICATE

Address of Ethics Committee: National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India	
Principal Investigator: Dr.A.Ajitha, Department of Maruthuvam	
Protocol title: Clinical evaluation of siddha formulation SAARA PARPAM in the treatment of AZHAL KALLADAIPPU.	
Documents filed	1) Protocol, 2) Data Collection forms 3) SAE(Pharmacovigilance)
Clinical trial Protocol (others – Specify)	**Yes**
Informed consent documents	**Yes**
Any other documents	-
Date of IEC approval & its number	**NIS/IEC/9/2014-15/1 – 26.08.2015**

We approve the trial to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study.

Chairman **Member-Secretary**

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drugs used in the Siddha formulation "**Saara parpam**" (Internal) for Azhal kalladaippu noi taken up for Post Graduation Dissertation studies by **Dr.A.Ajitha**, M.D.(S), II year, Department of Maruthuvam, 2016, are identified through Visual inspection, Experience, Education & Training, Organoleptic characters, Morphology, Micromorphology and Taxonomical methods as

Justicia adhatoda Linn. (Acanthaceae), Leaves

MEDICINAL BOTANY CHENNAI 600 047 National Institute of Siddha

Certificate No: NISMB2262016

Date: 28-4-2016

Authorized Signatory

Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai - 600 047. INDIA

சித்த மருத்துவ மைய ஆராய்ச்சி நிலையம், சென்னை - **600 106**
सिद्ध केंद्रीय अनुसन्धान संस्थान,
अण्णा सरकारी अस्पताल परिसर, अरुम्बाक्कम, चेन्नई – 600 106
SIDDHA CENTRAL RESEARCH INSTITUTE
(Central Council for Research in Siddha, Ministry of AYUSH, Govt. of India)
Anna Govt. Hospital Campus, Arumbakkam, Chennai – 600106
Phone: 044-2621 4925, Fax: 044-2621 4809
Website : www.siddhacouncil.com / Email : crisiddha@gmail.com

24.05.2016

CERTIFICATE

Certified that the samples submitted for identification by Dr. A. Ajitha, II Year MD Student, Department of Maruthuvam, National Institute of Siddha, Chennai-600 047 are identified as Navacharam – Ammonium chloride and Vediuppu – Potassium nitrate.

(R. Shakila)
Research Officer (Chemistry) & Head,
Department of Chemistry

(Dr. P. Elankani)
Research Officer (Scientist II) (Siddha)
for Assistant Director (Siddha) I/c

AARTHI SCANS & LABS

AN ISO 9001:2008 ORGANISATION

Name :	MRS. VADIVUKARASI.C	Age/Sex :	36Y/F
Branch :	TAMBARAM	SID No :	10014612
Ref. By :	Dr. SHANMUGAM.A MD.,DIP	SID Date :	15/02/2017

Ultrasound Abdomen

Liver:
Is normal in size and shows uniform echo texture. Intrahepatic biliary radicles, portal vein, hepatic veins and IVC appear normal.

Gall Bladder:
Is adequately distended. No calculus or internal echoes are seen.
Wall thickness is normal. The CBD is not dilated.

Pancreas:
Appears normal in size and shows uniform echo texture.
The pancreatic duct is normal. No calcifications are seen.

Spleen:
Appears normal in size and it shows uniform echo texture.

Kidneys:
RT.Kidney measures 9.0 x 4.5cms.
Two calculi measuring 5.0mm and 3.8mm are seen in the mid calyx of right kidney.
LT.Kidney measures 9.9 x 5.2cms.
Renal cortical echoes and Cortico medullary differentiation are normal on both sides.
Pelvicalyceal system on both sides are not dilated.

Bladder:
Is normal in contour. No intraluminal echoes are seen.
No calculus or diverticulum is seen.

No obvious paraaortic lymphadenopathy.
No free fluid in peritoneal cavity.
Visualized parts of bowel loops are normal in calibre , wall thickness and shows normal peristalsis.

VADAPALANI : # 60, 100 Feet Road, Chennai - 26 Ph: 2472 2420.Mob: 99401 10502
KILPAUK : # 766, P.H. Road, Chennai - 10. Ph: 2661 1255. Mob: 99401 10501
ALWARPET : # 17, C.V. Raman Road, Chennai -18. Ph: 2499 5636. Mob: 99400 22558
TONDIARPET : # 623, T.H. Road, Chennai -81. Ph: 2597 1717. Mob: 99401 10505
PERAMBUR : # 49/50, Paper Mills Road, Chennai - 11. Ph: 2670 6622. Mob: 95000 76590
PORUR : # 4/10, Arcot Road, Lakshmi Nagar, Chennai - 116. Ph: 2476 2421.Mob: 98400 95032
TAMBARAM : # 116, Ezhumalai Street, Mudichur Road, Chennai - 45. Ph: 2226 1944. Mob: 99400 22337
VELACHERY : # 17, Ist Main Road, Vijay Nagar, Chennai - 42. Ph: 2259 4143. Mob: 97899 38544
ANNA NAGAR : Plot No.2107, "L" Block, 13th Main Road, Chennai -40. Mob: 90030 81185
AARTHI DIAGNOSTICS : Plot No.2107, "L" Block, 13th Main Road, Chennai -40. Ph; 044 - 2620 8166

Note : This imaging modality is having its own limitations. Hence this report should be correlated with clinical features and other parameters.

AARTHI SCANS & LABS™

AN ISO 9001:2008 ORGANISATION

Name :	MRS. VADIVUKARASI.C	Age/Sex :	36Y/F
Branch :	TAMBARAM	SID No :	10014612
Ref. By :	Dr. SHANMUGAM.A MD.,DIP	SID Date :	15/02/2017

Ultrasound Abdomen

Uterus:
Measures 7.4 x 4.1cms. Anteverted.
Myometrium shows normal echogenicity.
Endometrium is regular and measures 4.5mm.
No focal lesion is seen.

Ovaries:
Right ovary measures 2.6 x 2.3cms.
Left ovary measures 2.6 x 2.3cms.
The echogenicity is normal on both sides.

P.O.D:
P.O.D. is free.
No adnexal mass lesion seen.

Impression:

- **Right renal calculi.**

Radiologist / Sonologist.

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AARTHI SCANS

60, 100 FEET ROAD , VADAPALANI,CHENNAI
Phone: 044-43992992
Email ID: info@aarthiscan.com

Name \ ID	.VADIVUKARASI \ 14612	Age / Sex	0 / F
Visit Date	15-2-2017	Ref.Doc	--

AARTHI SCANS & LABS

NABL Accredited Lab & ISO 9001:2008 Organisation

Name :	MRS. VADIVUKARASI.C	Age/Sex :	36Y/F
Branch :	TAMBARAM	SID No :	10022208
Ref. By :	Dr. SHANMUGAM.A MD.,DIP	SID Date :	22/04/2017

Ultrasound Abdomen

Liver:

Is normal in size and shows uniform echo texture. Intrahepatic biliary radicles, portal vein, hepatic veins and IVC appear normal.

Gall Bladder:

Is adequately distended. No calculus or internal echoes are seen.
Wall thickness is normal. The CBD is not dilated.

Pancreas:

Appears normal in size and shows uniform echo texture.
The pancreatic duct is normal. No calcifications are seen.

Spleen:

Appears normal in size and it shows uniform echo texture.

Kidneys:

RT.Kidney measures 9.0 x 3.7 cms.
LT.Kidney measures 9.9 x 5.4 cms.
Renal cortical echoes and Cortico medullary differentiation are normal on both sides.
Pelvicalyceal system on both sides are not dilated.

Bladder:

Is normal in contour. No intraluminal echoes are seen.
No calculus or diverticulum is seen.

No obvious paraaortic lymphadenopathy.
No free fluid in peritoneal cavity.
Visualized parts of bowel loops are normal in calibre , wall thickness and shows normal peristalsis.

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Note : This imaging modality is having its own limitations. Hence this report should be correlated with clinical features and other parameters.

AARTHI SCANS & LABS

NABL Accredited Lab & ISO 9001:2008 Organisation

Name :	MRS. VADIVUKARASI.C	Age/Sex :	36Y/F
Branch :	TAMBARAM	SID No :	10022208
Ref. By :	Dr. SHANMUGAM.A MD.,DIP	SID Date :	22/04/2017

Ultrasound Abdomen

Uterus:

Measures 7.0 x 4.3 cms. Retroverted.
Myometrium shows normal echogenicity.
Endometrium is regular and measures 4.5 mm.
No focal lesion is seen.

Ovaries:

Right ovary measures 2.5 x 2.1 cms.
Left ovary measures 2.6 x 2.3 cms.
The echogenicity is normal on both sides.

P.O.D:

P.O.D. is free.
No adnexal mass lesion seen.

Impression:

- **Normal Sonographic Study of Liver, Gall Bladder, Pancreas, Spleen, Both Kidneys, Bladder, Uterus, Both Ovaries and Adnexa.**

Radiologist / Sonologist

- VADAPALANI : # 60, 100 Feet Road, Chennai - 26 Ph: 2472 2420.Mob: 99401 10502
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- AARTHI DIAGNOSTICS : Plot No.2107, "L" Block, 13th Main Road, Chennai -40. Ph; 044 - 2620 8166

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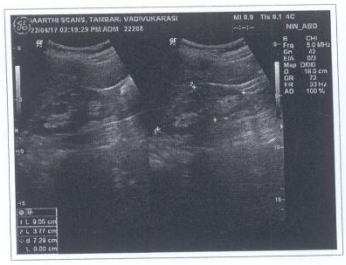
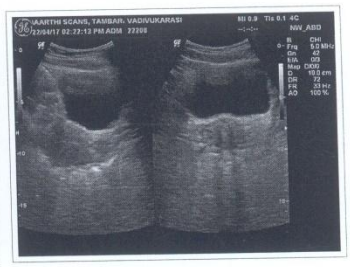
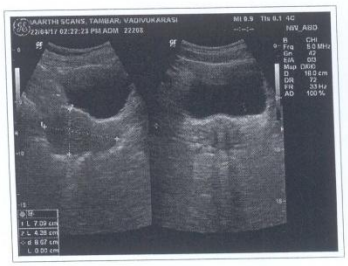
AARTHI SCANS

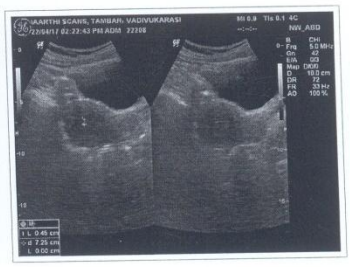
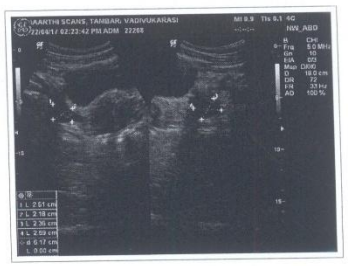
60, 100 FEET ROAD , VADAPALANI,CHENNAI
Phone: 044-43992992
Email ID: info@aarthiscan.com

Name \ ID	.VADIVUKARASI \ 22208	Age / Sex	0 / O
Visit Date	22-4-2017	Ref.Doc	--



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K.R.HOSPITAL

MUTHAIYA SCAN CENTRE
No:174,G.S.T.ROAD,GUDUVANCHERI -603 202
PH:044-27465366

Patient name	Mr. SRINIVASAN	**Age/Sex**	25 Years / Male
Patient ID	5014	**Visit No**	1
Referred by	Dr. SELF	**Visit Date**	22/02/2017

Abdomen and KUB Scan Report

Real time B-mode Ultrasonography of Abdomen and KUB done

Abdomen

Liver

Liver filled with homogeneous parenchymal echoes. No abscess or mass lesion in the liver

Gall Bladder

Gall bladder appeared normal. No calculi seen in the gall bladder

Common Duct

Commonduct appeared normal. No calculi seen in the commonduct.

Pancreas

Pancreas appeared normal

Spleen

Spleen appeared normal

Aorta

Aorta appeared normal. No para aortic nodes seen.

Peritoneal Cavity

Peritoneal cavity appeared normal

Adrenals

Adrenals appeared normal

KUB

Right Kidney

Right kidney measured 10.8 X 5.9 cms.

FEW CALCULI OF 5-6MMS PRESENT.

Left Kidney

Left kidney measured 10.6 X 6.2 cms.

Few calculi of 4-6mms present

Bladder

Bladder appeared normal

Prevoid measured 2.1 X 3.9 X 3.0 cms. (Volume = 12.78 cc.)

Prostate

Prostate appeared normal. No intra vesical enlargement of prostate gland seen.

Impression

NORMAL APPEARING LIVER, GALL BLADDER, COMMON DUCT, PANCREAS, SPLEEN, AORTA, PERITONEAL CAVITY, ADRENALS, PLEURAL SPACES, BOTH URETERS, BLADDER, PROSTATE

**** BILATERAL RENAL CALCULI.(simple).***

K.R.HOSPITAL

MUTHAIYA SCAN CENTRE

No:174,G.S.T.ROAD,GUDUVANCHERI -603 202

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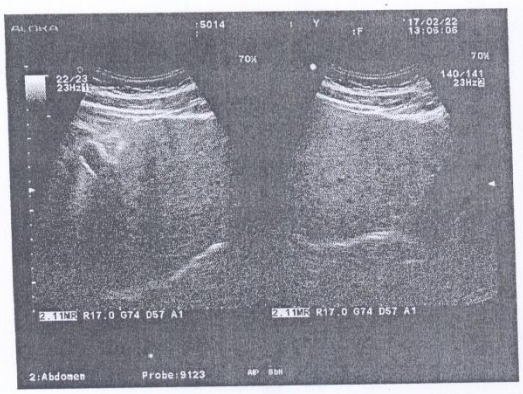

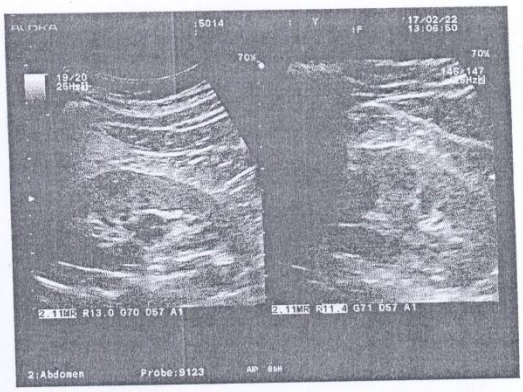

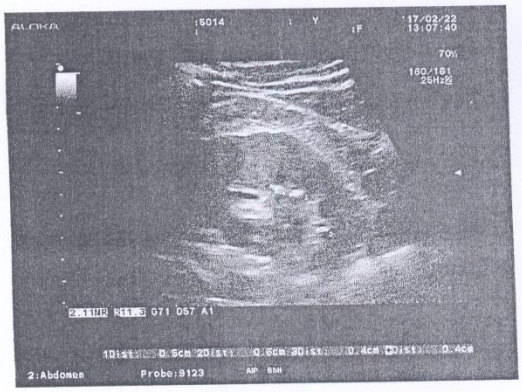

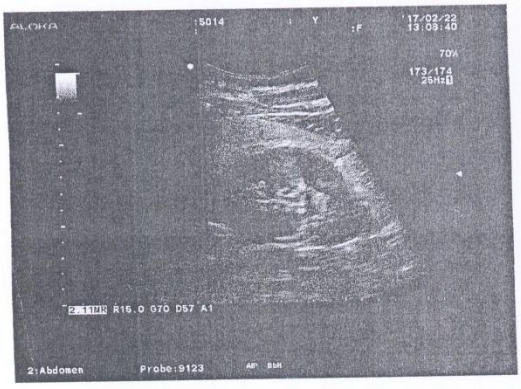

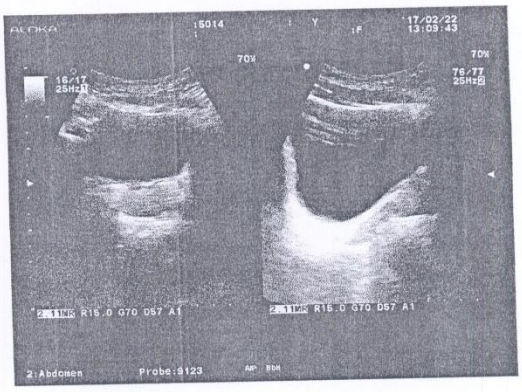

SRM MEDICAL COLLEGE HOSPITAL & RESEARCH CENTRE

SRM Nagar, Potheri, Kattankulathur-603 203

PHONE: 27455317 Extn: 2423 & 2424.

SRM UNIVERSITY

(Under section 3 of UGC Act 1956)

Department of RadioDiagnosis & Imaging

UHID No :	630217	**IP No :**		**Ward :**	
Name :	SRINIVASAN	**Age :**	25Y	**Gender :**	Male
Bill No :	FC171415	**Bill Date :**	12-Apr-2017 08:31	**USG Date :**	12/04/2017 08:59
USG No :	7271	**Ack. Date :**	12-Apr-2017 08:34	**Report Dt :**	12-Apr-2017 09:05

Clinical Diagnosis: **Others**

Investigation: **ULTRASOUND - Kub**

Observations :

KIDNEYS :
RT: Measures 8.5 x 4.6 Cm : LT: Measures 10.3 x 4.6 Cm.
Normal parenchymal echoes seen.
Pelvicalyceal system is not dilated.

URINARY BLADDER : Minimally distended.

PROSTATE :
Measures 3.3 x 2.9 x 2.9 Cm , VOL : 15.4 cc and Echogenicity is uniform.
Seminal vesicles are normal.

Impression :

- **No significant abnormality detected.**

--- Suggested CT KUB if clinically indicated.

Finalised Signature: **Signature of the Approver:**

Finalised By Name: Dr.M.P.Siva Shanker **Name of the Approver :** Dr.M.P.Siva Shanker

K.R.HOSPITAL

MUTHAIYA SCAN CENTRE

No:174,G.S.T.ROAD,GUDUVANCHERI -603 202

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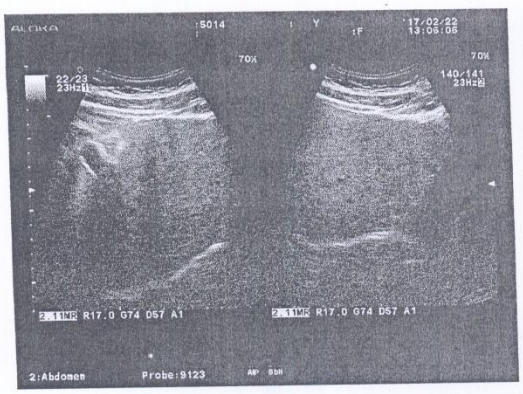

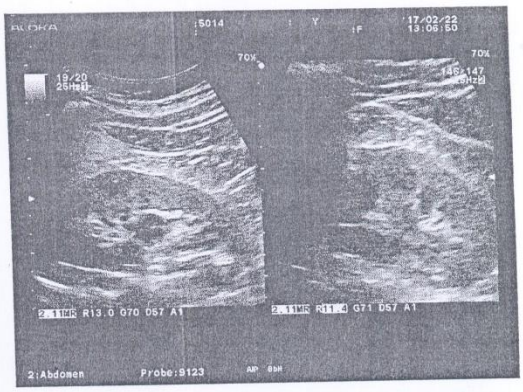

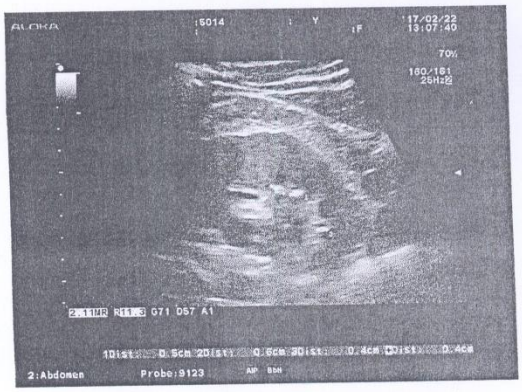

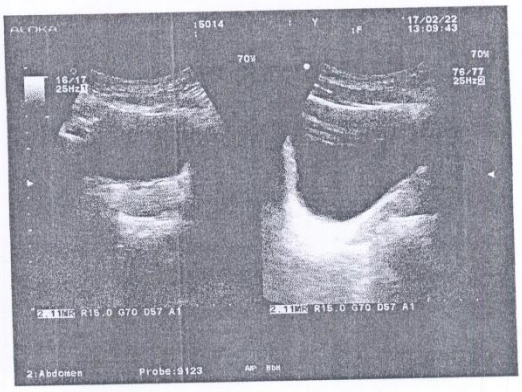

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